

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, organizers, not the society.

ABSTRACTS OF INDIVIDUAL PRESENTATIONS

Abdo Hintzman, Kholood [102] see Hamilton, M. Colleen

Abe, Chiharu (Hakodate City, Japan)

[164] *Strategies of Cultural Heritage Management in Hokkaido, Northern Japan*

The Minamikayabe area of southern Hokkaido consists of a small fishing town within the Hakodate city district. This area is rich in Jomon culture sites ranging from ca. 10,000 B.P. to 2,300 B.P., with a subsistence economy involving hunting, fishing, and gathering. The 91 sites in the area include the middle Jomon settlement site of Ofune and the initial to late Jomon site of Kakinoshima with a large earthen mound. Both sites have been designated as national historic sites. A beautiful, hollow clay Dogu figure found at Chobonaino in 1975 was declared a national treasure.

Our excavations in the Minamikayabe area over four decades have provided new information about Jomon subsistence practices and spirituality. Our efforts have been equally focused on developing a new business model for the protection of sites, proper excavation, and development of both indoor and outdoor museums. Our business model to achieve effective management of archaeological resources involves cooperation among members of government, universities, private companies, and citizens.

Aben, Kathrina (University of Maryland, College Park)

[262] *Invisible Communities: Developing a Filipino Discourse through Archaeology in Annapolis, Maryland*

Since the early 20th century United States expansion policies, a Filipino community has resided in Annapolis, Maryland. Despite this long-term occupation, there presence is void from the generally biracial representation of white and black communities in the city. In the summer of 2012, Archaeology in Annapolis addresses this invisibility through the oral narratives of Filipino descendent and current groups. This paper will address the importance of ethnographic methods as a preliminary step in archaeological ventures of underrepresented minorities. The interview analysis indicates the potential for Filipino archaeology based on material cultural behavior retention and transformation, identified sites, and public interest for future exploration.

Acabado, Stephen [7] see Ledesma, Charmaine

Acabado, Stephen (University of Guam) and Marlon Martin (Save the Ifugao Terraces Movement, Inc.)

[165] *Lessons from the 2012 Field Season of the Ifugao Archaeological Project*

The Ifugao Archaeological Project (IAP) is a collaborative research program between the Save the Ifugao Terraces Movement, Inc. (SITMo- a local, grassroots NGO whose primary goal is to develop conservation programs for the Ifugao Rice Terraces [IRT], a UNESCO World Heritage Site) and various academic institutions. The IRT was enshrined in the World Heritage list in 1991, but the listing failed to encourage research on the long-history of the human-made landscape. Top-down approaches to conservation seem to be a non-factor to long-term maintenance of the terraced fields. In addition, archaeology was also overlooked in conservation programs. As a community-led project, the community (through SITMo), sought to include the deep history of the Ifugao in developing conservation plans for their tangible and intangible heritage. Thus, the 2012 field season of the IAP provided the first archaeological documentation of an early Ifugao

village. The excavations will help provide information on the antiquity of the IRT and paleoenvironmental conditions of the region. Through the partnership of SITMo and various agencies, the 2012 field season became a success and widely received by local communities. In this paper, we present challenges and how we addressed them before, during, and after the field season.

Acosta-Ruiz, Marco Antonio

[107] *Análisis contextual de sitios con manifestaciones gráficas rupestres en la Cuenca de Sayula, Jalisco*

La presente ponencia aborda el estudio de una serie de sitios arqueológicos localizados en la Cuenca de Sayula, en el estado de Jalisco con presencia de manifestaciones gráficas rupestres en la técnica de petrograbado. El análisis no solo se limita a la descripción de algunos de los sitios y de sus motivos, sino que también expone aproximaciones a su posible interpretación partiendo desde la arqueología del paisaje y su interrelación con el ambiente en el cual se encuentran. De igual manera, se procesaron los resultados de la investigación con la ayuda de los Sistemas de Información Geográfica (SIG) como un fuerte apoyo para la interpretación tanto de los motivos como de la elección de los sitios para plasmar una parte de la ideología de las sociedades del pasado que se asentaron a lo largo y ancho de esta gran cuenca.

[107] *Discussant*

[107] *Chair*

Acuna, Mary Jane (Washington University in St. Louis)

[78] *Bundling a Building: Art, Ideology and Politics at El Achiotal, Petén, Guatemala, in the Late Preclassic Period (250 BCE – 250 CE)*

El Achiotal is a small Late Preclassic (250 B.C.E. – 250 C.E.) ceremonial and political center located along the western margin and off of the Central Karstic Uplands in Petén, Guatemala. Research in the main temple locus, Structure 5C-01, has identified a long architectural history spanning several centuries, likely dating from the late Middle Preclassic (400 – 250 BCE) through the Early Classic (250 – 600 CE) periods. Tunnel excavations have revealed buildings with iconographic embellishments that demonstrate that its population was fluent in the regional symbolic vocabulary of both the Late Preclassic Maya and the ancestral Olmec, while also able to maintain a unique artistic style. In this paper, stylistic and iconographic analysis of the murals, sculpted art and architecture in the sequence demonstrate shifts over time in the ideological and political affiliation of the site's leaders. These changes are further discussed in the context of political events occurring throughout the Petén during the Late and Terminal Preclassic periods.

Adachi, Noboru (University of Yamanashi, Department of Legal Medicine), Ken-ichi Shinoda (Department of Anthropology, National Museum of Na), Kazuo Umetsu (Department of Forensic Medicine, Yamagata University), Osamu Kondo (Department of Anthropology, University of Tokyo.) and Yukio Dodo (Department of Anatomy and Anthropology, Tohoku University)

[194] *Ethnic Derivation of the Hokkaido Ainu Inferred from Mitochondrial DNA Data*

In the present study, we examined the genealogy of 119 Ainu skeletons of the Edo period (about 400 to 200 years before present) excavated from Hokkaido, the northernmost island of

Japan, through ancient mitochondrial DNA analyses. Twenty haplogroups were observed in these individuals, with Haplogroups Y1 and N9b being predominant. The frequency of haplogroup Y1 is very high in the Okhotsk people, who had migrated from northeastern Eurasia to the coastal regions of northern and northeastern Hokkaido as well as southern Sakhalin during the fifth to the thirteenth century. On the contrary, haplogroup N9b has its highest frequency in the Hokkaido Jomon people. The fact that both Y1 and N9b are frequently observed in the Edo Ainu may indicate that the Ainu might have been established on the basis of the Hokkaido Jomon people with contributions from the Okhotsk people. Interestingly, haplogroup D4o1, which is almost exclusively observed in the Nivkh people, was observed in the Edo Ainu. On the contrary, some of the Edo Ainu haplogroups are absent in Native Siberians but are commonly observed in modern Japanese. These findings suggest the multiethnic contributions to the formation of the Ainu.

Adams, Charles (University of Arizona)

[67] *The Homol'ovi Research Program: Enriching Hopi History through Collaboration*

From 1984 to 2006 the Homol'ovi Research Program of the Arizona State Museum, University of Arizona, focused its research on the excavation of several large ancient Hopi villages along the Little Colorado River 60 miles south of the Hopi mesas in northeastern Arizona. Critical to the success of the program from the beginning were its collaborative efforts with the Hopi Cultural Preservation Office and its advisory team of community elders. This paper describes that process, the benefits of collaboration between archaeologists and descendant communities, and the enhancement of knowledge that resulted.

Adams, Jacob [150] see Fisher, Philip

Adams, Jacob (Washington State University)

[150] *An Experimental Study of Human Cores Compared to Geo-Cores*

Differentiating culturally modified artifacts from geo-facts (stone modified by natural processes) has long been a topic of concern in archaeology. This issue is particularly pertinent to pre-Clovis occupations in the Americas with the discovery of possible archaeological remains that keep pushing the colonization of the New World back in time. Potential pre-Clovis sites, such as the Calico site in California, have come under heavy scrutiny in regard to differentiating cultural from natural specimens. Naturally made and culturally made lithic specimens will often exhibit similar characteristics such as point of impact and bulb of force. As lithic artifacts are the most common form of evidence for human behavior, it is important to have the ability to discern cultural artifacts from geo-facts. Here we present an experimental pilot study examining differences in fracture patterns and other characteristics of geo-cores and human made cores. The geo-cores were subjected to fracture from tumbling down a rocky hillside and the human made cores were systematically reduced by flintknapping.

[150] *Chair*

Adams, Ron (AINW)

[195] *Ethnoarchaeological Perspectives on the Social Dynamics of Livestock Use in Eastern Indonesia*

It has become increasingly evident that livestock was not merely a subsistence necessity in many early prehistoric agricultural societies. The symbolic importance of livestock, particularly cattle, in art and iconography in Neolithic societies attests to a conspicuous emphasis on these domesticated animals that extended beyond their nutritional value as a source of food or their role as strictly economic commodities. Drawing upon ethnoarchaeological work conducted in eastern Indonesia, this

paper discusses the use of livestock in traditional societies and its implications for interpreting the role of livestock in the social realm of prehistoric agrarian societies. Large domesticated animals on the island of Sumba and elsewhere in Indonesia are generally not an ancillary dietary necessity to supplement cereal crops. Instead, they are reserved for ancient traditions tied to past socio-political orders that continue to define the relations between individuals and groups. These traditions include ritual feasts as well as the erection of stone monuments and elaborate houses, all of which are undertakings distinguished and characterized by the livestock required for their completion. In these contexts, domesticated animals are arguably the life-blood of the social and material world, serving a purpose that extends far beyond subsistence or as a secular commodity.

Addison, David [27] see Filimoehala, Christopher

Adelsberger, Katherine (Knox College) and Benjamin Porter (University of California, Berkeley)

[209] *Are you Dhiban Strong? Designing, Promoting, and Managing a Middle Eastern Field School*

Located in west-central Jordan, the Dhiban Project Field School teaches undergraduate students archaeological and environmental studies field research techniques. The students are also introduced to Jordan's culture history, contemporary societies, and Islam. The program has grown recently from five undergraduate students each summer to now approximately 20 students. Most students attend one of the authors' institutions and represent the diversity of the current college generation, although a majority are female. Students are drawn to the project for different reasons, from field training and cultural experience to a basic desire to study abroad. Yet Dhiban is not an "easy" project, certainly not for students looking for a relaxing summer experience. Dhiban is located in a semi-arid environment and a relatively impoverished region with residents wary of outsiders. Students find the project physically and psychologically challenging, albeit often a welcome change from ordinary life. Because of these conditions, the project approaches this session's question concerning future growth and inclusion with caution. Field projects can provide a rich cultural experience for students, but these aspects of the curriculum subtract from teaching field techniques. The authors will explore how they design, market, and implement an effective field school curriculum under these adverse conditions.

Adnan, Aaqib [84] see Junker, Laura

Adovasio, J.M. [87] see Pitblado, Bonnie

Adovasio, James (Mercyhurst Archaeological Institute)

[135] *Forensic Sedimentology: Retrospect 2013*

During the 1970s, high-resolution analytical and descriptive protocols were developed for the characterization and description of microstrata at Meadowcroft Rockshelter, Washington County, Pennsylvania. Beginning in the 1980s, these same protocols—collectively subsumed under the rubric forensic sedimentology—were applied in a succession of successful ARPA prosecutions. The ability to essentially "fingerprint" sediments was a critical element in all of the cases, which included both open and closed archaeological loci. Highlights of several past cases are presented to illustrate the potency of those protocols. New developments in instrumentation are also detailed in terms of their applicability to future cases.

Affolter, Jehanne [142] see Fisher, Lynn

Agarwal, Sabrina (UC Berkeley), Clark Larsen (Department of Anthropology, The Ohio State University), Joshua Sadvari

(Department of Anthropology, The Ohio State University), Carolyn Nakamura (Institute for History, Universiteit Leiden) and Jessica Pearson (School of Archaeology, Classics, and Egyptology)

[32] *Roles for the Sexes: The Bioarchaeology of Women and Men at Çatalhöyük*

There has been longstanding interest in the role of women in early agricultural settlements, and early interpretation of material culture at Çatalhöyük was suggestive of gender differences in power with a fixation on mother goddess imagery. This paper presents bioarchaeological findings on lifestyle, activity, and diet. Comparison is made between this bioarchaeological data and the interpretations of gender from other data sets such as burial goods, figurines, and wall art. No differences between the sexes are seen in bone mass, bone fragility, degenerative disease, or isotopic dietary signatures. This work suggests that bone loss, some aspects of activity, and diet did not follow a strictly sex-related division between the sexes. Variability in the types of burials goods also appear to reflect individual choices rather than strictly division of material, and recent study of funerary practices, imagery and figurines suggest more complex interpretation of gendered identity. Combination of these data sets can be used to focus on aspects of sexual dimorphism, gendered division of labor, and the role of individual and community variation, and choice, over the lifecourse.

[74] *Chair*

Agarwal, Sabrina [74] see Beauchesne, Patrick

Agorsah, E. Kofi (Portland State University)

[115] *The Kormantse Factor in African Identity in the Diaspora*

This presentation examines the impact of the small fishing settlement of Kormantse in Ghana on the reconstruction and interpretation of African identity among societies in the Diaspora in the Caribbean and the Americas. Despite its use as the main point of reference by many people and societies in the African diaspora, Kormantse remains only as an "imaginary reference point". Evidence drawn from archaeological, ethnographic and historical sources is used to identify features and historical processes of the role played by Kormantse as a player in the trans-Atlantic encounter. It is observed that Kormantse appears to have made an indelible cultural identity mark, more than even the most significant and larger ports of the encounter during and after the colonial period in West Africa. Cultural formation and transformation processes in the historic settlement will be used to discuss cultural responses of the settlement and people in surrounding areas to colonial activities in the trans-Atlantic encounter.

Aguilar-Franco, Manuel [229] see Lopez, Julieta

Aguirre, Alberto (CEQ-COLMIC)

[107] *Arqueología de la arquitectura para la producción. Un caso de estudio en la tierra caliente michoacana*

En el marco de la llamada Arqueología industrial, el estudio de la arquitectura para la producción es un campo hasta ahora poco explorado en Michoacán. Este trabajo presenta un estudio de caso bajo este enfoque; se trata de la ex hacienda Lombardía, productora agroindustrial de arroz, añaíl y azúcar, en la región terracalienteña michoacana, que vio su esplendor a finales del siglo XIX y en la primera mitad del siglo XX.

La evidencia arqueológica, constituida por muros, restos de acueductos, tinajas de obrajes, restos de construcciones, entre otros elementos, aparentemente diseminados en el paisaje actual, son la materialización de la estrecha relación entre el entorno ambiental y la visión agroindustrial. Esta visión por su parte, tuvo

matices importantes en dos períodos históricos: en el Porfiriato y en el posterior a la Reforma agraria.

Agustí, Jordi (ICREA. Institut de paleoecología humana i Evolució social. Tarragona. Spain.) and Hugues-Alexandre Blain (Institut de Paleoecología humana i Evolució social)

[215] *Climate Dynamics and Early Human Dispersal out of Africa*

Early human settlement in Western Eurasia was strongly influenced by ecological conditions rather than locomotor capabilities, its first occurrence in Western Europe being documented in periods of favorable climatic conditions. Despite the glacial-interglacial dynamics, the late Pliocene climate in the region analyzed must have remained reasonably mild and stable. The early Pleistocene is characterized by a sharp climatic deterioration, which possibly impeded the settlement of this region by the early human population from the southern Caucasus. Shortly afterwards, when the climatic conditions are again favorable, this human presence is suddenly attested by thousands of lithic artifacts of Mode I at the sites of Fuente Nueva 3 and Barranco León 5 in the Guadix-Baza Basin (Spain), as well as hominid remains at Trinchera Elefante in the Atapuerca karstic complex (Spain). The climatic amelioration at the early-middle Pleistocene boundary again favored a human presence, as attested by Trinchera Dolina in Atapuerca and the site of Cúllar Baza 1 in the Guadix-Baza Basin. The data reported here clearly support the idea that an early human presence in Europe was strongly constrained by climatic and environmental conditions, and that physiography or cultural factors played a minor role.

Agustin, Agnolin [168] see Scheinsohn, Vivian

Aikens, C. Melvin (University of Oregon)

[283] *Late Pleistocene and Holocene Development of Anthropogenic Landscapes in China, Korea, Japan, and the Russian Far East*

Humans of the Homo erectus stage were present in East Asia by a million years ago, with modern Homo sapiens prevalent after about 35,000 BP. With late Pleistocene warming of the global climate after about 22,000 BP, populations grew rapidly. In China, early farming communities and associated fields and water works appeared by about 9000 BP. By about 4000 BP royal governments, expanding economies, and explosive population growth were rapidly accelerating the expansion of anthropogenic landscapes in China, while large cities, roads, field and canal systems, and lavish mounded tombs for a growing aristocratic class proliferated steadily. Beyond China, stable hunting-fishing-gathering communities, rapid population growth, and agricultural beginnings characterized Manchuria, Korea, the Russian Far East, and Japan by about 7000 BP. In Korea and Japan the spread of paddy-field rice and mixed dryland agriculture, an associated proliferation of villages, and the inception of large towns and monumental mounded tombs for a growing social elite were well under way by about 3000 BP. Rice paddies, canals, dry fields, polders reclaimed from coastal zones, roads, fortresses, towns, and cities grew rapidly in Korea and Japan after about 1000 BP, as socioeconomic complexity and human population continued to grow rapidly.

Ainis, Amira [125] see Brown, Kaitlin

Ajithprasad, P. [147] see Costa, August

Akojima, Isao [214] see Sakai, Masato

Akoshima, Kaoru (Tohoku University)

[112] Integrating Lithic Microwear Traces with Site Structure and Settlement Mobility Patterns in the Upper Paleolithic of Northeast Japan
 The paper investigates theoretical aspects of lithic use-wear analysis in conjunction with more macro-scale data structure such as tool distributions, conjoins, techno-typological variability and raw materials procurement. Case studies from the Japanese Upper Paleolithic period in Northeastern Japan are evaluated from technological organization perspectives in which use-wear traces are not only elucidated as evidence of "behavioral episodes" on "living floors" but as accumulated records of the cultural system on the landscape. The Kaminou A site in Yamagata Prefecture was excavated by Department of Archaeology, Tohoku University in 1987, 1991, 2000, and the final excavation and analytical results were published in 2012. The assemblage mainly consists of backed knives, burins, end-scrapers, side-scrapers, notches and denticulates. Spatial and technological analyses indicate that they constitute two different "phases", that is, phase A (3,028 artifacts, AMS dated to $23,230 \pm 80$ BP) and phase B (4,454 artifacts). Phase A suggests relationship with Central and Western Japan, and phase B belongs to the developed blade based industry of Northeast Japan. Microwear data from different sites are discussed in terms of inter-site variability. Methodological problems include model building to compare use-wear traces detected on different locations of the same adaptive system.

Alarcon, Carmela (PAURARKU, Centro de Investigaciones Andinas) and Matthew Piscitelli (University of Illinois at Chicago)

[70] Botanical Analysis of Plant Remains from Ceremonial Architecture at the Late Archaic Site of Huaricanga in the Fortaleza Valley of Peru

One of the main objectives of archaeological investigations at the Late Archaic (3,000-1,800 B.C.) site of Huaricanga has been to characterize the activities carried out within a series of early temple structures. Unfortunately, ceremonial architecture tends to lack macro-artifacts as dictated by culturally defined norms of ritual purity. However, botanical remains, recovered through a diverse array of techniques, have proven incredibly valuable in reconstructing the ancient activities within the sacred spaces at Huaricanga. In addition, a major research theme in the Central Andes has been the use and management of natural resources. More specifically, archaeologists have debated the role of grains/cereals in the emergence of complex societies in Peru. This poster presents the results of a variety of macro-botanical analyses performed not only to reconstruct ceremonial activities at Huaricanga, but also to clarify the role of plant resources during the Late Archaic Period along the north central coast of Peru.

Alarcón Ledesma, Carmela [285] see Piscitelli, Matthew

Albaitero R.P., Juan (WillametteCRA)

[250] Manos and Metates from San Nicolas de Los Ranchos, Part Time Stoneworkers on Non-industrialized Production

Manos and metates are the archaeological tool sets that we can still find on rural modern day mesoamerican households. Checking the archaeological record their form has not changed much over time and according to the information from the conquest chronicles they are still used in the same way, on the other hand in most of the cases their production has been industrialized. The following is the description of the non-mechanized production of manos and metates by part time workers and the way the new tools are used and stored in their houses, trying to present viable archaeological models for the organization of the production of the tools and comparing the results to other ethnoarchaeological reports pointing out patterns and differences in the way metates are produced.

Albert, Rosa (ICREA/University of Barcelona), Irene Esteban

and Cabanes Dan

[172] Phytoliths as a Proxy For Paleovegetation Reconstruction and Use of Plant Resources by Early Hominins

Adaptation of early human populations is closely linked to climate, environment and the way in which they were able to utilize the available resources. Our research attempts to reconstruct the vegetation present at two archaeological sites during two decisive moments in the history of humankind: i) Olduvai Gorge (Tanzania) where first Homo habilis were identified, and ii) Mossel Bay (South Africa) occupied by early Homo sapiens populations.

Using phytoliths -siliceous microremains that reproduce the cellular tissue of plants- we try to reconstruct the vegetation of these two sites, to better understand the influence of the environment in human evolution. Our research includes the description and phytolith study of modern analogous landscapes which are later compared to the archaeological results. Fourier Transformed Infrared Spectroscopy (FT-IR) is used to determine the mineralogical components of sediments to understand the preservation conditions of the identified remains.

The results obtained to date at Olduvai Gorge have allowed reconstructing the vegetation of FLK and HWKEE areas, where the remains of Parantropus boisei and Homo habilis were recovered. Vegetation studies at Mossel Bay, have finalized at PP13B, showing the use of dicotyledonous leaf plants during low occupation moments. PP5/6 studies are still in process.

Alberti, Benjamin (Framingham State University) and Andres Laguens

[14] Reticent Pots, Preoccupied People: Coping with Ontological Ambiguity in First Millennium AD Northwest Argentina

"The exchange model of action supposes that the other of the subject is another subject, not an object; and this, of course, is what perspectivism is all about" (Marilyn Strathern, 1992, Writing Societies, Writing Persons). An opening premise of this paper is that pots can be subjectivized. Anthropomorphic pots and bodily practices at sites in the Ambato Valley and among the La Candelaria of Salta and Tucuman provinces in northwest Argentina during the first millennium AD point towards ontological equivalence in relations among bodies, pots and persons.

Amazonian perspectivism suggests that ontological predation—the utter annihilation of an Other through changed perspective—is one dominant mode of relation which requires maximal subjectivization of the Other. In the specific cases discussed here, two regimes of "potly subjectification" are argued for—one evidenced through daily practices of food preparation; the other through corporeal play and the making of pots as bodies. There was an inherent danger in establishing such relations. As such, both modes are characterized by fear and care—fear of the potential predatory relations established through repeated exchanges, and care that those relations are managed appropriately. Hence, the cases of "reticent" pots—deliberately only partially subjectivized—and disarticulated human bodies.

Alconini, Sonia [48] see Hard, Robert

Alcover Firpi, Omar and Lic. David Ricardo Del Cid Castillo (Proyecto Arqueológico San Bartolo - Xultun)

[21] Development of the 12H3 Pyramid in Xultun

At the site of Xultun, Guatemala, a massive plaza group comprised the heart of the ancient city, located on a naturally elevated area and designated as the B group plaza. This locality contains one of the oldest and largest ritual plazas in Xultun and is surrounded by monumental architecture. Rising above all other structures is the 12H3 pyramid, the largest structure by volume at Xultun. During the 2012 field season, the first excavations were conducted in and around the pyramid uncovering crucial details regarding its possible socio-political function, construction style and architectural phases. In this paper, we explain and examine the recent excavations at 12H3 and propose a functional

interpretation of the pyramid's use and role in Maya society. This pyramid was repeatedly elaborated and expanded upon—from the Late Preclassic (250BC-AD250) through the Classic period (AD250-900)—demonstrating the longevity of its importance at Xultun alongside its four construction phases and four stelae (Early Classic to Late Classic in style and date) erected along its western façade. Possessing characteristics similar to other Early Classic pyramids, 12H3 can provide a better understanding regarding the Maya creation of a sacred space and how such spaces were maintained over time.

Aldenderfer, Mark [216] see Massa, Giovanni

Aldenderfer, Mark (University of California) and Margarita Gleba (Institute of Archaeology, University College London)
[249] *Textile Technology in Nepal in the 5th-8th Centuries CE: The Case of Samdzong*

Textile remains were recovered in the course of an ongoing project in Samdzong, Upper Mustang, Nepal, a location close to the border with Tibet. The sites are shaft tombs in very high altitude, remote locations, dated to the 5th-8th centuries CE. The dry climate and high altitude favored the preservation of organic materials, which generally do not survive in archaeological contexts, permitting exploration of textile technology in the area. One of the objects recovered from the elite Samdzong 5 tomb complex is composed of textile bands to which copper, glass and cloth beads are attached and may constitute the remains of a complex decorative headwear, which may have been attached to a gold/silver mask. Another textile from Samdzong 5 is a very fine silk fabric dyed red. There is no evidence for local silk production and the technical features of the find suggest that Samdzong was inserted into the long-distance trade network of the Silk Road. The paper presents the first results of textile and dye analyses of the Samdzong textiles and explores how indigenous communities in Nepal developed and adapted new textile technologies to fit local cultural and economical needs. The wider implications of these findings are discussed.

Alder, Christina [217] see Weyrich, Laura

Alderson, Helen (University of Otago) and Mark D. McCoy (University of Otago)

[244] *Geochemically Sourcing the Architectural Basalt of Nan Madol: New pXRF Results from the 2012 Field Survey in Nan Madol, Pohnpei, Federated States of Micronesia*

The site of Nan Madol is an 81 hectare prehistoric administrative and ritual complex built into the lagoon of the volcanic high island of Pohnpei in the Federated States of Micronesia and consists of 93 islets built from basalt columns and boulders between A.D. 900 and A.D. 1650. In this paper we present new geochemical sourcing research aimed at modeling the effort expended by ancient Pohnpeians in building the site's monumental scaled structures. Specifically, we will present the results of our 2012 field season during which we analyzed a subsection of the basalt architecture using portable XRF (pXRF). Once building material was sourced, a GIS model was then used to estimate changes in effort expenditure over time calculated based on weight of the blocks moved as well as the distance traversed. These results were then compared with several models representing expected outcomes in terms of the historical trajectory of labor mobilization over the history of the site's construction and use.

Alegria, Crystal [269] see Moe, Jeanne

Alessa, Lilian [23] see Murphy, John

Alex, Bridget (Harvard University), Bridget Alex (Harvard University Anthropology and Human Evolution), Elisabetta Boaretto (Radiocarbon Dating Laboratory, Weizmann Institute) and Daniel Master (Wheaton College, Archaeology)
[79] *Establishing Best Practice for Bone Collection and Storage at the Site of Ashkelon, Israel*

Post-excavation treatment of bone can cause diagenetic alteration, which may alter stable isotope ratios, radiocarbon content, and ancient DNA. This study tested the effect of collection and storage procedures on bones excavated at the site of Ashkelon, Israel. We compared the standard collection treatment (washing, drying in the sun, storage in containers on-site) to a strict treatment in which bones were collected with sediment, in foil, and kept cool. Preservation of specimens was evaluated by measuring percent collagen by weight and Fourier Transform Infrared Spectrometry (FTIR) of mineral powder and insoluble fraction. The results showed no significant difference between treatments. We also compared preservation parameters of bones that have been stored on site for 0, 8, and 13 years to estimate the rate of bone diagenesis. The results suggest that time in storage had less of an effect on preservation than other variables such as thickness of bone and depositional context. Overall the study suggests that collection and storage procedures at Ashkelon are sufficient for bone preservation. While this conclusion only applies to the particular bone sample and conditions of Ashkelon, the study serves as a model for establishing best practice for bone handling.

[79] *Chair*

Alex, Bridget [79] see Alex, Bridget

Alfonso-Durruty, Marta (Kansas State University, SASW Department)
[26]

Haunted by the Hunter: In the trail of the South American Models for Prehistoric Hunter-Gatherers

The historical influence of North America has led to the application of foreign models into South American Archaeological studies. In particular, cultural-evolution models and the associated Paleoindian and Archaic concepts simplify and obscure the diversity and complexity of hunter-gatherers in the South America. Hunter-gatherers of both the Paleoindian and the Archaic periods are commonly assumed to be egalitarian and simple. However, South American hunter-gatherers are characterized, even in sites as early as Monte Verde, for the diversity and flexibility of their economic adaptations and social organizations. The divergence from North American models includes the opportunistic exploitation of mega fauna, the presence of early permanent or semi-permanent settlements, transegalaritarian formations, monumental architecture, and, for some, an emphasis on marine resources, and relatively stable patterns of transhumance between the coast and the interior. Decades of archaeological and bioarchaeological research indicate that a careful consideration of the evidence accumulated can lead to models, questions, and research agendas that more accurately describe and assess a prehistoric that escapes foreign models as well as dogmatic ideas regarding the complexity and variability of early human occupations in South America.

[26] *Chair*

Allard, Francis (Indiana University of Pennsylvania)

[216] *The Timing, Nature, and Sociopolitical Dimensions of Early Bronze Metallurgy in Southeast China*

Discussions of pre-Han bronzes in Lingnan (present-day Guangdong and Guangxi) have so far mostly focused on the timing of the earliest evidence for metallurgy in the region, as well

as the issue of stylistic similarities and differences with bronzes made in central and northern China. On the basis of presently available evidence, Lingnan's earliest locally produced bronzes date to around 1000 BCE, postdating by many hundreds of years similar developments in other regions of China. Archaeologists of Southeast Asia have also used the evidence from Lingnan to argue for – or against – the independence from China of that region's earliest metallurgy. Along with reviewing the issues of timing and input from outside regions, this presentation discusses the (limited) range of technological evidence for early bronze metallurgy in Lingnan, as well as its sociopolitical dimensions as inferred from funerary evidence. It concludes that emerging inequality in Lingnan during the first half of the first millennium BCE was not based on the strict control of bronze production. Instead, the burials increasingly display an association between high status graves and the presence of bronzes of central or northern Chinese inspiration.

Allen, Melinda [27] see Morrison, Alex

Allen, Mitch (Left Coast Press, Inc.)

[99] *From Marshalltown to Mark Twain: Challenges in Publishing Literary Archaeology*
This presentation will examine archaeologists' efforts to write more literary, accessible work for a general audience and the risks publishers like me take to publish these experimental works. Lessons learned from these attempts might be useful to others seeking a wider readership. Archaeologists are forced to stretch beyond self-imposed professional restraints and fill in gaps in the knowledge base to construct narratives about the past for the wider public. In doing so, they compete with novelists, pseudoarchaeologists, and journalists —none bound by the limits of data— in offering interpretations of the past. Archaeologists must also learn a wider variety of genres and media to identify which medium is the most effective for reaching specific audiences. They may consider sharing their authority by collaborating with others who might communicate the message better than the archaeologists can alone. Central to the presentation is the publisher's role in encouraging authors toward more accessible writing techniques and the ways in which publishers can aid scholars to reach broader audiences.

Allen, Mark (California State Polytechnic University, Pomona)

[177] *Scales of Warfare and Violence in California and Australia: Fighting Foragers and Collectors in Conflict*
There has been a tremendous proliferation of archaeological and anthropological analyses of warfare in middle range societies and early states over the past two decades. In contrast, it is often assumed (largely through negative evidence) that warfare and violence were not common among foragers, or even semi-sedentary collectors. A second factor that has limited the study of hunter-gatherer conflict is the difficulty of archaeological detection. The most cited evidence for prehistoric conflict includes fortifications, specialized weapons, iconography, and large skeletal populations; none of which are widely associated with hunter-gatherers. Fortunately, two major cultural areas provide tremendous potential to advance our understanding of the range of violence and warfare among both foragers and collectors. California and Australia share several advantages, including: abundant archaeological and cultural resource management investigations, rich ethnographic sources, detailed ethnohistorical accounts, large volumes of curated weapons and armor, and indigenous cosmologies and oral histories that provide meaningful insight. Both areas are vast and characterized by extreme environmental variation inhabited by highly diverse hunter-gatherers. It is argued here that comparisons within and between California and Australia can help sweep away the factors which have heretofore limited the study of hunter-gatherer violence and warfare.

[177]

Chair

Allen, Melinda (University of Auckland)

[255] *Hawaiian Origins: The Marquesan Homeland Hypothesis Revisited*

Patrick Kirch's research, both within the Hawaiian Islands and beyond, has been central to forging our understanding of Hawaiian origins and the chronology of island settlement for more than four decades. As he outlines in his most recent review of the Hawaiian sequence, improved radiocarbon chronologies along with new archaeological and paleoecological evidence has led to a growing consensus that the archipelago was settled around the 11th to 13th centuries AD, from a central East Polynesian source area. Historically, the Marquesas Islands, some 4000 km southeast of the Hawaiian chain, have been considered the most likely homeland for early Hawaiian colonists, with later arrivals from the Society Islands. In this paper I revisit the possibility of initial colonization of the Hawaiian chain from the Marquesas. New evidence on the chronology and character of early Marquesan settlement sites, along with other recent analyses relevant to understanding of cultural relatedness, are used to further evaluate the Marquesan homeland hypothesis.

Allentoft, Morten [263] see Oskam, Charlotte

Allison, James (Brigham Young University)

[16] *The Archaeology of Archaeology: 2012 Excavations at Alkali Ridge Site 13*

Alkali Ridge Site 13 is one of the largest, and most extensively excavated Pueblo I villages in the Northern Southwest. It also is one of the earliest Pueblo I villages, dating to the late A.D. 700s. The site was first excavated in 1932 and 1933 by J.O. Brew of Harvard University, who dug all or part of 118 storage rooms, 11 pit houses, and 25 surface habitation rooms belonging to the early Pueblo I component. In 2012, the first excavations at the site since Brew's work focused on reexcavation of several storage rooms previously excavated in 1932, screening of backdirt from the 1932 excavations, and limited excavation into previously undisturbed rooms. These excavations were on a much smaller scale than Brew's, but they provide information about the field techniques and artifact collection strategies used in the 1930s that was not available in either the published report or the field notes; the new excavations also provide the opportunity to compare the results of modern excavation techniques and those used in the 1930s, and to consider the strengths and weaknesses of each approach.

Allison, James [175] see Richards, Katie

al-Nahar, Maysoon [201] see Olszewski, Deborah

Aloua, Ruth-Rebeccalynne (Simon Fraser University, Department of Archaeology)

[203] *Discussant*

ALOUI-SIOTIS, ELENI [178] see Chaviara, Artemi

Alt, Susan (Indiana University Bloomington)

[24] *Immigrants on the Border: Cahokia and the Synergy of Mississippian on the Edge*

Change in Mississippian societies has usually been investigated at centers, because Mississippian polities, while occasionally viewed from the peripheries, have not been theorized as having frontiers and borderlands. Borderlands, or frontiers, as places of liminality, dynamism, and instability have not typically been seen as integral to understanding Mississippian societies. The Cahokia case forces

a rethinking of tradition approaches. In particular, new data from the Emerald Site, a frontier mound center, demonstrates that not only were there borderlands, but that these places were an important part of creating Mississippian through synergistic processes of immigration, hybridity, and proselytization.

Altaha, Mark (WMAT-Historic Preservation Office), John R. Welch (Simon Fraser University & Fort Apache Heritage Foundation) and Nicholas Laluk (University of Arizona)

[64] *The Last People to Abandon Grasshopper: University of Arizona Field School Influences on White Mountain Apache Tribal Programs*

Grasshopper's impact on archaeology and archaeologists is undeniable, but what consequences has the 30-season program had for the White Mountain Apache Tribe, its people, and its lands? How has Grasshopper as an institution and a group of people affected White Mountain Apache heritage stewardship and economic development, repatriation, and tourism initiatives? These questions and other matters relating to Grasshopper's local legacies are discussed from the vantage point of the tribe's current and past historic preservation officers.

Altaha, Mark [110] see Welch, John

Altawee, Mark [23] see Murphy, John

Altman, Heidi [151] see Peres, Tanya

Alvarado, Luis Adrián [17] see Manzanilla, Linda

Alvarez-Calderon, Rosabella [286] see Klaus, Haagen

Alvarez-Sandoval, Brenda A. (LANGEBIO CINVESTAV-IPN), Linda R. Manzanilla (Instituto de Investigaciones Antropológicas, UNAM) and Rafael Montiel (LANGEBIO CINVESTAV IPN)

[41] *Sex Determination of Ancient Human Remains by HRM Analysis: The Case of Teopancazco, Teotihuacan*

Sex identification of archaeological human remains is a common problem especially if the skeletons are sub-adult, incomplete or damaged. Current methods are based on the analysis of the amelogenin gene that can be found on both chromosomes X and Y. There are sequence and size divergences between the X and Y versions, thus allowing sex determination after amplification of short fragments (106 and 112 bp). However, this method is not sensitive enough on samples presenting an extremely low amount and poor quality of DNA. Therefore, we developed a new method based on real-time polymerase chain reaction (PCR) amplification of smaller fragments (58 and 64 bp), followed by High Resolution Melting analysis. The method has proven to be useful even for samples in which the original method was inefficient. With this method we have been able to determine the sex of adults and infants found in Teopancazco, Teotihuacan, which usually present small amounts of highly degraded genetic material. This new molecular tool is rapid, sensitive, effective, and less prone to spread contamination after PCR. Furthermore, as shorter fragments are amplified, we believe the random allele drop-out phenomena could be less severe. Problematic samples can be resolved by analysis of multiple replicas, as recommended elsewhere.

Álvarez-Sandoval, Brenda A. [17] see Montiel, Rafael

Alveshere, Andrea (Institute for Synthesis in Interdisciplinary Science)

[117]

Forgotten Studies, Buried Data: Unearthing the Hidden Potential of Interdisciplinary Archaeological Records

Created to manage ancient and forensic DNA taphonomy data, the Biomolecular Preservation and Detection Information System (BIOPADIS) has proven a valuable tool for the compilation and analysis of a diversity of quantitative and qualitative archaeological data. Ideally-suited for assessing correlations among the results of geoarchaeological, zooarchaeological, and molecular analyses, this relational database system accommodates a comprehensive array of data on environmental (depositional through post-excavational) contexts, specimen properties, laboratory strategies, and analytical testing results. Due to the simplicity and flexibility of the BIOPADIS database design, this system is useful as a stand-alone solution for management of records from individual research projects and may be easily adapted to accommodate a virtually limitless range of additional data classes. BIOPADIS also holds great potential to function as a nexus for the archival and exchange of raw data among a global community of researchers and institutions. This may be of particular value in improving the accessibility of "negative" research results that are poor candidates for traditional publishing, of studies reported in the "grey literature" of Cultural Resource Management, and of other data that are otherwise unlikely to be widely distributed. A selection of interesting archaeological case studies highlights the features and potential of this system.

Amador, Fabio (National Geographic Society) and Guillermo de Anda (Universidad Autónoma de Yucatan)

[109] *Seeing Cenotes: New Strategies in Studying the Flooded Caves of the Yucatan Peninsula.*

Recent discoveries in flooded caves in the Yucatan Peninsula have proven that these systems, commonly known as "cenotes," contain an important quantity of very well preserved archaeological information. These flooded systems contain materials dating from the last Ice Age to the days of the ancient Maya that have been found in extraordinary state of preservation. Old paradigms are being challenged in light of the new information. However these fantastic systems are very fragile and must be treated with extreme care and under non-intrusive methods in order to get the best results. Researchers from the National Geographic Society and the University of Yucatan have developed new methods and strategies to study cenotes, and the first results of this collaboration are here presented.

Amano, Noel [7] see Ledesma, Charmaine

Ambrose, Stanley (U. Illinois, Urbana-Champaign)

[131] *Consequences of the Toba Super-eruption for Human Adaptation and Evolution*

The Toba super-eruption 73 ka may have caused a six-year long volcanic winter and intensified an 1800-year-long era of the coldest temperatures recorded in the Greenland ice cores. The early last glacial era of extreme cold from 70-60 ka likely prolonged the environmental and demographic impacts. Environmental, paleontological and genetic evidence shows that this period witnessed deforestation in central India, low lake levels Africa, boreal conditions in western Europe, regional population bottlenecks in several large mammal species, including humans and neanderthals, and regional or total extinction of a dozen southeast Asian large mammal species. Modern humans and neanderthals apparently responded to this era of severe glacial environments in different ways. African archaeological evidence suggests a transition in social and territorial organization from small, defended territories to extended inter-group cooperative networks. Information sharing may have helped to reduce risk in the unpredictable environments of the early last glacial. Conversely, neanderthals apparently continued to live in small, closed territories with limited intergroup interactions, often involving violence and cannibalism. African moderns behaved

more like human tribes; neanderthals behaved more like primate troops. These differences in territorial organization and information sharing may have been responsible for the replacement of neanderthals by African modern humans.

Ambrose, Stanley H. [172] see Salazar-García, Domingo Carlos

Ames, Nicholas (University of California, Berkeley), Hanna Huynh (University of California, Berkeley), Alan Farahani (University of California, Berkeley) and Benjamin Porter (University of California, Berkeley)

[149] *Heavy-Fraction Microdebris Enhance the Interpretation of Cultural Practices in Middle Islamic West-Central Jordan*

In this poster, we present heavy fraction data from a barrel-vaulted room from the archaeological site of Dhiban, Jordan, dating to the Middle Islamic period (12th - 15th centuries CE). We argue for the analysis of material residues smaller than four millimeters ("microdebris") deriving from flotation samples collected in the course of archaeological excavation. Relatively little is known about daily life during the Middle Islamic period outside of written sources. High-resolution investigation of both large and small residues facilitates the identification of past cultural activities in this context. Our analysis reveals that smaller residue sizes often provide information distinct from larger residue sizes, especially in the ubiquity or presence of different materials. Ceramics are abundant in larger fraction sizes, yet they are relatively infrequent in smaller residue sizes, probably due to depositional practices. Remains of marine vertebrates and invertebrates that provide evidence of long-distance trade and water-resource use are rarely found in larger residue sizes, but are present even in the smallest remains. Our research suggests that the analysis of microdebris is a valuable source of data that supplements the interpretation of past cultural practices.

Ames, Christopher [162] see Bisson, Michael

Ames, Kenneth (Portland State University)

[170] *Discussant*

Ames, Christopher (McGill University, Department of Anthropology), Carlos E. Cordova (Department of Geography, Oklahoma State University), April Nowell (Department of Anthropology, University of Victoria), James T. Pokines (Department of Anatomy and Neurobiology, Boston University) and Michael S. Bisson (Department of Anthropology, McGill University)

[224] *Hominin Occupation and Landscape Evolution at the Druze Marsh Site in Northeast Jordan*

The former Druze Marsh is located approximately 75 km east of Amman in the Hashemite Kingdom of Jordan. It covers roughly 2 km² adjacent to the town of North Azraq and sits on the northwest edge of Qa' Azraq, the salt mudflat marking the lowest point of the 13,000 km² Azraq basin. The region is well known for producing both surface and buried Paleolithic remains, but little was known from the Druze Marsh itself until over-pumping of the aquifer lowered the water table and exposed the former marsh bed in the mid-1990s. Through a series of test pits and controlled excavation in the dry marsh bed our team has identified extensive buried archaeological landscapes from the Late Lower, Middle, Upper, and Epipaleolithic. This sequence is embedded in a stratigraphic succession characterized by cyclical aggradations of lacustrine and palustrine deposits intercalated with erosional unconformities and pedogenic carbonate development, suggesting considerable shifts in the local paleoenvironments and geomorphic processes throughout the late Pleistocene. Deciphering prehistoric settlement and land-use in this context requires a detailed understanding of landscape evolution and site formation in order to disentangle the geogenic and behavioral contributions to the patterning of the archaeological record.

Amundsen-Meyer, Lindsay

[264] *Nested Landscapes: Ecological and Spiritual Use of Plains Landscape during the Late Prehistoric Period*

The Willow Creek Study Region, located along the eastern edge of the foothills in Southern Alberta (the wintering ground of the Blackfoot people), is unique both in the overall number and diversity of archaeological sites as well as the number of culturally-important places present. The study region is ecologically rich, with easy access to critical winter resources such as wood, water and bison. However, new evidence from a multi-year survey project suggests that ideological influences were also playing an important role in prehistoric settlement choices. The evidence suggests that people were moving along known trails between a series of established, culturally important stopping places, such as Willow Creek, within an ecologically rich landscape. This pattern appears to have emerged during the Late Prehistoric, showing a significant shift from settlement patterns of earlier periods. The specific location of Late Prehistoric archaeological sites on the landscape in this region appears to be tied to views, important landmarks, and named places. In this paper, I propose to paint a picture of nested land use in which both ecological and ideological influences are important site selection criteria.

[264] *Chair*

Anastassova, Elka [227] see Gurova, Maria

Ancona Aragón, Iliana [288] see Bishop, Ronald

Anderies, John M [23] see Freeman, Jacob

Anders, Jake (University of Alaska-Anchorage)

[137] *Model Behavior: A Study in Upland Aleut/Unangan Archaeological Site Modeling*

Until recently, non-coastal or upland archaeological sites in the Aleutian Islands of Alaska have been a poorly studied avenue of archaeological inquiry. Since 2007, the University of Alaska Anchorage has led intensive research on upland archaeological sites on the southwestern portion of Adak Island in the Central Aleutian Islands. As a part of this research, a GIS-based weighted-value site location model was created based on assumptions about how maritime-oriented precontact Aleut or Unangan people used an upland environment that was largely devoid of substantial food resources, and empirical observations about observed site locations. Analysis of various upland site characteristics suggests the presence of functional differences between upland sites, which may indicate a more diversified use of upland areas than previously thought. Drawing on parameters of the natural, socio-cultural, and maritime environments that are thought to have affected the lives of pre-Russian Aleut people, the model provides future researchers in the Aleutian Islands with an explicit and quantified template that can be tested and refined as further research is conducted.

Andersen, Søren [68] see Gron, Kurt

Anderson, Cheryl (University of Nevada, Las Vegas)

[39] *Mortuary Ritual and Identity among the Ancestral Tarahumara*

This research provides evidence that supports the idea that the ancestral Tarahumara had a distinct cultural identity in the precolonial period extending back at least 600 years. The idea of a precontact Tarahumara cultural identity is based on mortuary data from archaeological sites that are consistent with ethnohistoric accounts of Tarahumara burial rituals. These ritual behaviors are linked to Tarahumara ideology and are quite distinct from other

groups in the region. The practices include the use of burial caves, multiple interments, wrapping bodies in mats and blankets, placement of fire next to the deceased and grave goods such as food and personal items. San Francisco de Borja (A.D. 1280–1400) is a mortuary cave site located in Chihuahua, Mexico and it was excavated in the 1950s by Richard and Sheila Brooks. A recent reanalysis of the human remains from this site has been performed and processes such as commingling, burning, and weathering were recorded. Additionally, grave items such as corn cobs, beads and pottery were located in the cave. The results of the analysis of the remains from this site show that the historic Tarahumara are descendants of these precolonial peoples.

Anderson, Kirk (Museum of Northern Arizona, Flagstaff)

[123] *Landscape Dynamics Near Tolakai, New Mexico*

The geomorphic setting of Tolakai is similar to many ephemeral drainages in the southwestern U.S., where deep arroyos expose Late Holocene alluvium. Two distinct alluvial terraces are present, the older correlating with the Tsegi Formation (app. 7000 B.C. to A.D. 700), and the younger correlating with the Naha Formation (A.D. 1450 – 1880). The Tsegi-aged deposits have agricultural rock alignments across the surface and contain buried Basketmaker III through early PII (app. A.D. 400 – 1050) cultural materials. The Naha-aged deposits contain over 20 juniper trees buried by up to 2 meters of well-stratified alluvial and eolian deposits. Based on tree diameter and relative geomorphic position, it appears there are two periods of germination. Nearby chronologies from buried trees also indicate two distinct germination periods, one during the A.D. 1400s and another in the 1700s. After analysis of 22 tree samples, we hope to determine if the same periods of germination and sedimentation occurred at Tolakai as elsewhere in the region. Ethnohistoric accounts of Spanish incursions and Navajo settlements are detailed for this area, and combining these rich cultural histories with high-resolution dendrogeomorphic reconstructions provides valuable information regarding landscape dynamics during the Protohistoric period.

Anderson, Elyse (University of Florida)

[127] *The Timucuan Division of Animistic Practice*

A critical examination of Timucuan ethnography strongly hints at animistic practice, that human and animal interactions were guided by both ecological and cosmological principles. Furthermore, the literature suggests these relations were gendered. Timucuan men, women, and two-spirits engaged with animal persons in unique ways. This variation could potentially be reflected in the archaeological record. Looking specifically at Silver Glen Run (8LA1-W Locus C), an ancestral Timucuan village site in Florida, a methodological approach to capture nuanced animal and human interaction is proposed.

Anderson, Kirk [131] see Elson, Mark

Anderson, Douglas

[189] *The Circumpolar Laboratory at Brown University's Haffenreffer Museum of Anthropology: Past Achievements, Present Activities, Future Prospects*

Since its creation in 1956 by Professor J. Louis Giddings, the first director of Brown University's Haffenreffer Museum of Anthropology, the Circumpolar Program at Brown University has conducted archaeological, ethnoarchaeological, and ethnographic research across the northern circumpolar zone, provided fieldwork and laboratory opportunities in northern archaeology for a vast number of undergraduate and graduate students, trained a generation of fieldworkers and teachers now working in the North and training new generations, and contributed through publications

and presentations to our current understanding of archaeological diversity and ethnographic traditions across the northern world. Today, the Circumpolar Laboratory, established in 1973 at the Haffenreffer Museum, remains deeply engaged in interdisciplinary research, student training, active programs of fieldwork, and the analysis and preservation of critical archaeological collections from some of the most important archaeological sites in Western Alaska.

This poster presents an overview of the achievements of the Circumpolar Laboratory's past and present staff, students, and alumni, its current projects, and resources available through Brown University's Circumpolar Laboratory to researchers and others interested in northern archaeology and the interdisciplinary study of the peoples of the North.

Anderson, Shelby (Portland State University)

[258] *The Difficulty of Sourcing Hunter-Gatherer Pottery: A Case Study from Northern Alaska*

Social networks are central to northern hunter-gatherer lifeways, past and present. Networks are a conduit for ideas, information, and material goods to move within and between groups. Social network size and extent change over time in relation to various social and environmental factors, also serving as a social safety net in times of stress. Pottery sourcing is one approach to studying hunter-gatherer social networks. Reconstructing past networks can be difficult, however, particularly in northern settings where higher mobility, transport costs, and a shortened season for raw material procurement and production are all significant factors in shaping ceramic assemblages. The challenges of reconstructing social networks and studying northern pottery traditions as part of the hunter-gatherer foraging spectrum are considered in this paper through a northern Alaskan case study. Geochemical sourcing and formal technological data are used to test hypotheses about social networks over the last 1000 years in northwest Alaska. Results of these analyses indicate that ceramics were circulating more widely than expected and hint at changes in raw material procurement strategies during the study period. Mitigating factors unique to the study of hunter-gatherer pottery (e.g. mobility, transport, etc.) are considered in the context of these findings.

Arderton, John (Northern Michigan University), Marla Buckmaster, James Paquette and Robert Legg

[119] *Archaeology on the Cusp of a Changing World: The GLO# 3 site (20MQ140), an Early Fur Trade-Era Winter Occupation in the Lake Superior Basin, USA*

Seventeen years ago, four iconographic ("Jesuit") brass rings, a French clasp knife blade, and a number of other early Fur Trade-Era trade goods were discovered at the terminus of a Native American trail approximately 15 km west of Lake Superior's south shore in the Upper Peninsula of Michigan, USA. Limited follow-up formal test excavations at the site in 1999 and 2000 uncovered a small number of additional European trade items and confirmed the presence of an early contact period Native occupation at the locale. In 2012, expanded excavations at the site revealed a well preserved hearth and other features, large amounts of fragmented and burned bone (primarily from moose and beaver), a fifth iconographic ring, glass trade beads, a leather belt and birch bark fragments, iron implements, and triangular stone projectile points. Preliminary interpretations of the site suggest it is a circa 1630–1650 proto-historic or early historic contact-related occupation connected to Native American use of interior winter territories. While firm tribal affiliation is unclear, it is likely the site is Anishinaabe.

Andolina, Darren (University of California, Davis) and Adie Whitaker (Far Western Anthropological Research Group, Inc.)

[12] *Habitat Suitability and the Establishment and Maintenance of Social Boundaries*

The earliest evidence of widespread and prolonged coastal residence in Northwestern California dates only to the Late

Holocene. Linguistic models purport a series of occupations of the coast beginning with the Wiyot and Yurok in Humboldt Bay and the Klamath River, followed by Oregon Athabaskan groups north of the Klamath, and finally, California Athabaskan Groups along the rugged coastline south of Humboldt Bay. South of Shelter Cove the record is less clear, with evidence for failed Athabaskan colonizations, and the purported use of the area by a number of groups including interior Cahto and Yuki and coastal bands of Yuki and Pomo.

While social boundaries are well documented between Athabaskan and non-Athabaskan groups there is less definition in these supposed common-use areas. We argue that the marginal habitat along the narrow coastal strip inhibited long-term use of the area and was prohibitive to establishment and maintenance of social boundaries. Extrapolating from the northwestern California example, we offer a general prediction of where social boundaries are expected to be rigorously maintained and therefore archaeologically visible.

Andrade, Agustín (Zona Arqueológica de Monte Albán, INAH)

[114] *Los contextos funerarios de San Sebastián Teitipac*

Durante el desarrollo del proyecto de Salvamento de Arqueológico Libramiento Sur Oaxaca, 2010, se exploraron diversos sitios arqueológicos en los Valles Centrales de Oaxaca. Uno de estos sitios es El Popote ubicado al Oeste del poblado actual de San Sebastián Teitipac.

Este asentamiento conformado por dos áreas: una pequeña área nuclear de 2 estructuras, y otra área terraceda, en la cual se localizaron diversos tipos de enterramientos, desde simples excavaciones realizadas en el subsuelo, hasta una tumba en la que se localizaron más de 7 individuos. Además, de lo anterior, vale la pena destacar que estos mismos enterramientos pertenecen a dos períodos culturales diferentes: Monte Albán II (200 a.C. -200 d.C.) y Monte Albán IIIB-IV (450-950 d.C.). En la presente ponencia se pretende discutir las implicaciones culturales que se han logrado establecer a partir del estudio de los materiales osteológicos recuperados en este sitio arqueológico.

Andrefsky, William (Washington State University)

[150] *Is It an Artifact? Exploring Morphological Variability in Fractured Chert Debris*

Trained archaeologists can easily recognize elaborately shaped stone tools and cores made from chipped tool-stone. Similarly, they can easily recognizedebitage and debris from the production of stone tools when those items are found within the contexts of archaeological sites. However, isolated fragments of cryptocrystalline raw material found on site survey or those found within deposits with no "diagnostic" stone tools are often less easily recognized as human production debris or human made artifacts. This study explores the variation found within less diagnostically shaped cryptocrystalline silica specimens to determine the characteristics most useful for discriminating culturally modified debris or tool production by-products. Four populations of chert debris (naturally exfoliating fragments, tumbled cobble fragments, hard-hammer core reduction fragments, ancient bifacial reduction flakes) are compared. The archaeological specimens are taken from excavations at the Birch Creek Site along the Owyhee River in Oregon. The raw materials for the other three samples are taken from outcrop locations used by aboriginal populations within 60 km of the excavations. Results of the study show that all four populations have can be discriminated from each other at varying levels of resolution.

[150] *Chair*

Andrefsky Jr., William [150] see Fisher, Philip

Andrefsky, Jr., William [150] see Adams, Jacob

Andrews, Bradford (Pacific Lutheran University)

[229] *Calixtlahuaca Stone Tools: Technological Trends and Their Socioeconomic Implications*

This paper discusses the general patterns reflected by the flaked stone obsidian tools from Postclassic Calixtlahuaca. Its assemblage is interesting for a number of reasons. First, it represents the only assemblage from a provincial context that is primarily composed of gray obsidian. Second, although core-blade technology is predominant, it also has bifacial and bipolar-related artifacts. The biface material includes a variety of biface implements and debitage related to their production, which indicates that bifaces were at least partially processed in the city's households. The bipolar material is a major surprise because this technology is generally thought to be a Formative period reduction strategy, largely replaced by core-blade technology later in time. These data are used to explore the dynamics of trade and exchange that may have played out in the western periphery of the empire. One important question revolves around the issue of whether Calixtlahuaca maintained economic independence even after it became part of the empire. Interestingly, these data indicate a substantial change in the stone tool provisioning system post-Aztec conquest. Specifically, it appears that Calixtlahuaca acquired significantly more obsidian via the commercial system anchored in the Basin of Mexico.

Andrus, Fred [172] see West, Catherine

Angel, Jules (The Ohio State University, Dept. of Anthropology)

[135] *What the Water Gave Me: A Case Study of Bone Recovery from a Fluvial Environment in Clark County, Ohio.*

Bones that are transported fluvially always present recovery challenges. Many factors influence where the elements may be found, such as length of time since death, if the body was left whole or not, scavenger activity, water flow, natural impediments like rocks and trees, slope from deposition area, size, slope and land use of floodplain areas, as well as element size, shape, and condition (with or without soft tissue). Conducting meaningful experiments given these variables is also difficult. In this situation, case studies can present useful information to future investigators tasked with finding such remains. In the case presented here, remains of a person were found in a creek bed by anthropologists two years after the initial disappearance, and after numerous searches by the police, non-dog search and rescue units, and members of the public. An initial site survey, including informal talks with the manager of the land, plus another walk through with the recovery team, yielded valuable information that drove the search. This case illustrates how personnel specifically trained in searching for human bone material can increase the likelihood of finding remains even after an area has been searched and cleared by other types of search and recovery teams.

Angell, Elizabeth (Columbia University)

[134] *Risk Archipelagos: Islands of Disaster in Urban Turkey*

Writing after Hurricane Katrina, Dawdy (2006) argues of post-disaster contexts that "perhaps under no other conditions are the relations between people and their landscape quite so self-conscious or quite so active." The paper explores the experience of dwelling in the seismically active landscape of contemporary urban Turkey, a country crisscrossed with fault lines and subject to frequent and often devastating earthquakes, most recently in the Marmara region just west of Istanbul (1999) and the eastern Turkish province of Van (2011). As disasters that originate from the interaction of geology and the built environment, earthquakes are profoundly local events: they threaten particular places in particular ways, generating risk and ruin out of place-specific assemblages of fault orientation, building composition, population distribution, legal and political infrastructure, and cultural behavior. Drawing on historical and ethnographic research and engaging

with the archaeological literature on disaster, the paper will examine the spatial effects of seismicity through the islands of risk and destruction in Turkish cities dealing with the experience of recent earthquakes (Van) and the anticipation of future ones (Istanbul).

Anselmi, Lisa (Buffalo State College) and Kevin Williams

(SUNY Buffalo State)

[40] *Reconnecting with the Past: Locating Historical Graves Using Ground Penetrating Radar in Western New York*

This poster presents the preliminary results of two public outreach projects undertaken by the SUNY Buffalo State Archaeological Field School and members of the Buffalo State Earth Sciences and Science Education department in summer 2012. Our first project aided the Ellicottville Town Historical Society in an exploration of the Jefferson St. Cemetery in Ellicottville, NY. The second project aided People, Inc., the leading non-profit human services agency in Western New York, in their effort to restore the Niagara County Almshouse Cemetery in Lockport, NY. Both projects were completed using ground penetrating radar in order to delineate areas of the cemeteries that contain unmarked graves and, in the case of the Almshouse Cemetery, the perimeter of the graveyard. The results of the projects will be used to erect central markers to memorialize unmarked burials at each cemetery and to restore the boundary of the Almshouse Cemetery.

Anson, Dimitri [27] see Pietruszewsky, Michael

Anspach, Easton (Columbia University)

[134] *Bounded Earth: A Look at Inka Wak'as*

Both the spiritual and physical worlds of the ancient Andes were permeated by a complex system of sacred shrines known as wak'as. A great deal of work has been done to date on the interconnection and importance of these shrines within the elaborate Inka perception and manipulation of a recursive, animate landscape. This has included a great deal of work on the intricate network of lines that connected these shrines, known as queus, as well the role of wak'as in state rituals. Recently there has been a shift in focus to examining the structure of wak'as as a reflection of Inka perceptions of their world, including the setting apart and bounding of these shrines from the surrounding landscape. This paper will examine this phenomenon by considering wak'as as cosmological, ritual, and physical islands, set apart from the rest of the world and reached through ceremonial journeys undertaken as a way of connecting the disparate realms and spaces of the Andean universe. In addition, this work will explore how these wak'as have become part of modern archaeological parks, which are themselves islands in a growing and changing urban landscape, and how this inclusion has affected their use and efficacy.

[200] *Discussant*

Anthony, David (Hartwick College)

[211] *Why Should Archaeologists Care About Language? Lessons from the Old World*

Linguistics and archaeology, companion disciplines in the nationalist 19th century, have grown apart. Yet all anthropologists recognize that language is a central element of social identity, that it encodes all symbolic beliefs, and that it contains numerous clues as to geographic origin. Reconstructed proto-languages are like texts retrieved from the non-literate past, rich with meanings and concepts that are obtainable no other way. In North America the shallow time depth of written texts is challenging, but in the Old World the long written record demonstrates where languages shift or persist over time, and where language and material culture correspond. New approaches to language and archaeology in the Old World might show how language and material culture could be

utilized in the New World.

Antillón, Rafael Cruz [252] see Hull, Sharon

Anton, Susan and J. Josh Snodgrass (University of Oregon)

[215] *Greener Pastures? Climate Variability and Dispersals in Early Homo*

Members of the genus *Homo* were the first hominins to disperse from Africa and likely the first to move into temperate environments. Shortly after 2 million years ago, early *Homo* comprised a diverse set of species in East and South Africa with an archaeological record suggestive of a dietary shift and increased ranging. By about 1.8 million years ago the genus was broadly dispersed in Asia. A number of models have been proposed to explain this dispersal. Early *Homo* species together are larger in brain and body size than *Australopithecus*; thus, increased size, home range, and efficiency in ranging have been implicated. The genus arose during a time of heightened climatic variability, and increased developmental and behavioral plasticity have been hypothesized as keys to successful dispersal into varied environments. We consider recent fossil and archaeological evidence that offers some surprising insights about intraspecific variation in size, body proportions and ranging. Much evidence suggests that increased diet quality and decreased extrinsic mortality (e.g., predation rates) may be factors in successful dispersal. Further, data from recent humans offer important clues as to how to interrogate the fossil/archaeological record to consider the role of climatic variability on dispersal in early *Homo*.

Antoniou, Anna [205] see Mattes, Matt

Aquino, Valorie (University of New Mexico)

[256] *Chronological Calibration and the Dynamics of Climate and Culture Change at the Lowland Maya Center of Uxbenká, Belize*

A great deal of scholarly and popular attention has focused on the role of climate change for the widespread decline of long-lived Maya political institutions at the end of the Classic Period (AD 800-1000). It is generally accepted that there was no pan-Maya collapse and that the decline primarily affected political strategies rather than the societal fabric of Maya civilization. Determining the exact relationships between climate and culture change, however, is dependent on making chronological and spatial correlations between cultural and climatic datasets. At the Preclassic and Classic Period Maya center of Uxbenká in southern Belize, we have reduced the chronological uncertainties of these records by combining long-count dates on stone monuments, architectural stratigraphy and high-precision AMS 14C dates within a Bayesian statistical framework. We compared these data with a subannually resolved and precisely uranium-series dated paleoclimate record from a nearby cave/speleothem deposit. We discuss how these techniques for chronology-building have illuminated our understanding of Uxbenká's historical and political trajectory within the context of regional climatic change.

[256] *Chair*

Aragon, Leslie [43] see Fladd, Samantha

Aragon, Leslie

[85] *What's in a Name? Ontologies of Hohokam Figurines*

Anthropologists, and increasingly archaeologists, are using the word 'ontology' with escalating frequency. In Philosophy, where it originated, several subdivisions exist within the discipline, all of which deal with grouping things that exist into categories. What

can archaeologists learn by taking this concept from philosophy and applying it to archaeology? Further, how do we recognize the ontologies of others, particularly those who did not leave a written record, in the archaeological record? The way that people categorize things plays a role in how they are disposed of. Patterns in depositional practices emerge as visible traces in the archaeological record that allow us to recognize other people's ontologies. This is an important concept for archaeologists to address prehistoric value, since the value of a given object cannot be assessed without knowing how people in the past categorized things. In my work with anthropomorphic Hohokam figurines, I use ontology to explore the life histories of figurines from their manufacture, through deposition in the archaeological record, and subsequent excavation in modern times. This poster describes the techniques used to consider ontological approaches in archaeology as well as the findings of my current project.

Arakawa, Fumiyasu [65] see Glowacki, Donna

Arakawa, Fumiyasu (New Mexico State University), David Gonzales (Fort Lewis College) and Alan Koenig (U.S. Geological Survey)

[86] *Methodology for Sourcing Sanidine Basalt (Trachyte) Tempered Materials in the American Southwest*

For several decades, archaeologists have used various methods to source pottery clay and temper depending upon site context and available resources. This research begins by investigating sanidine-bearing igneous temper sources (also known as trachyte or trachybassalt) that was frequently used for pottery manufacture by the ancestral Pueblo people in the Mesa Verde region of the American Southwest from tenth to thirteenth century. In addition to identifying temper sources in the region, a major goal of this research is to discuss petrographic and geochemical analyses (i.e. electron microprobe, Laser-Ablation Inductively Coupled Plasma Mass Spectrometry [LA-ICP MS or ICP-MS], and Instrumental Neutron Activation [INAA]) and to evaluate the strengths and weaknesses of each analysis. Consequently, the results of these analyses and subsequent discussion will aid other researchers sourcing pottery tempered materials from diverse archaeological contexts.

Araujo, Astolfo [80] see Okumura, Mercedes

Araujo, Astolfo (Museum of Archaeology and Ethnology - USP), Aldo Malagó (Museum of Archaeology and Ethnology, University of), Olivia Ricci (UNESP - Rio Claro, Brazil) and Felipe Sabatelau (Museum of Archaeology and Ethnology, University of)

[224] *Microartifacts Redux: What Happened with the Potential for Site Discovery?*

Thirty years ago, Fladmark's (1982) seminal paper on microartifacts was published. In the years that followed, several theoretical and methodological advances were achieved. However, it can be said that nowadays microartifact analysis is far from being a standard practice in archaeology. Even when used, microartifact analysis is usually directed to intrasite spatial analysis, and very rarely inside a landscape approach, or as a discovery technique. We will discuss some reasons for this state of the art, and present preliminary results from SE Brazil. It is our claim that microartifacts can be successfully used as markers of human activity in the landscape, especially in tropical regions, and that the development of techniques suited for this aim must be pursued.

Archer, Will [155] see McPherron, Shannon

Ardren, Traci (University of Miami)

[127] *Social Imaginaries as a Means to Understand*

Ancient Childhood

Humans are social beings and we are a product of our relationships—this is true of our own lives today as well as the lives of ancient people. Identities, as a form of social community building, are one of the primary mechanisms by which cultures reproduce themselves through instruction and performance of values, goals, behaviors, etc. While such behaviors and beliefs leave a material residue available to archaeologists, these data are reflections of common understandings, worked out through dialogue and interaction. Viewing the social identities of ancient societies as forms of the social imaginary allows us to see material culture and its circulations as part of a discourse about identity and membership. This can promote a study of contingent change rather than universal cultural evolution as well as an ancient past filled with interested agents who make strategic choices. I will explore the application of the social imaginary as a framework in which to understand how age based identities were deployed or rejected within ancient Maya society of southern Mexico. Labor, especially the spiritual work of community redemption, was a central part of the performance of this imaginary.

Ardura, Dominique [124] see Tushingham, Shannon

Arendt, Beatrix (John Milner Associates)

[271] *Tracking Evidence for Missionization at the Hopedale Mission in Canada*

The Moravians initially established the Hopedale mission along the coast of Labrador, Canada in 1782, with the intention of "delivering salvation" without changing any aspect of Inuit culture. However, the missionaries quickly realized that converting the Inuit required dismantling their existing ideological system, and ensuring Inuit progression toward contemporary civilization. The introduction of Western institutions such as schools, medicine, and even social etiquette was intended to elevate the Inuit from their perceived squalor, and reach a social ideal founded firmly in Christian as well as Enlightenment theories. The common belief of the time was that political, moral and intellectual advancement was tied directly to material acquisition. Similarly, the progression of the Inuit on the road to religious salvation was rooted in the values of materialism, such as the consumption of particular European goods. In this paper, I explore the historical and archaeological data from Hopedale to track the import of European materials as proxy evidence for identifying changing consumption habits of both Inuit and Moravians.

[271] *Chair*

Arévalo Pakarati, Cristián [164] see Van Tilburg, Jo Anne

Argañaraz, Diego [193] see Fondevila, Luis

Argueta , Cristina [166] see Pineda De Carias, Maria-Cristina

Arkush, Brooke [183] see Wismer-Lanoë, Meredith

Armendariz, Xabier [7] see Walker Vadillo, Veronica

Armstrong, Stephanie [254] see Roksandic, Mirjana

Armstrong, Douglas (Syracuse University)

[292] *Systems of Enslavement and Transformations to Freedom in the Caribbean*

Archaeological explorations of contexts and outcomes of colonial encounters between Africans and Europeans in the Caribbean region. The emergence of large scale plantation economies led to

a social and economic system built upon the exploitation of the slave trade and the use of enslaved laborers. This paper will examine archaeological case studies from British colonial settings (Barbados and Jamaica) and the Danish West Indies (St. Jan and St. Thomas), to explore the emergence and social systems built upon slave labor and ways in which those who were enslaved attempted to resist slavery and gain freedom and ways in which the struggle for freedom has been integrated into heritage management through interpretive archaeology.

Arnauld, Charlotte (CNRS)

[144] *Early to Late Classic Population Mobility in La Joyanca, Northwestern Petén, Guatemala*
Most occupational histories of Maya Lowland cities register a substantial growth in population change from Early to Late Classic periods. What has not been established is the proportion of such increase that must be assigned to demographic ("natural") growth in situ and immigration from rural areas. At La Joyanca, Guatemala, a medium-sized center with a 160-hectare residential zone, a burst of monumental construction occurred in both the public plaza and neighborhoods by AD 600-700. While the paleoenvironmental sequence (based on the analysis of a core taken from a lake 5 km from La Joyanca) indicates an abrupt decrease of local agricultural activities by 550-600, pollen and erosional data signal continuity at the regional scale. We hypothesize that migrants from the lake area steadily moved to the city, where they contributed to ongoing construction programs. A systematic test pit program has been recently applied to the La Joyanca residential neighborhoods, allowing for diachronic analysis of internal dynamics during Classic times. Preliminary results and interpretations from the 2012 field season are presented.

[144] *Chair*

Arndt, Ursula (Simon Fraser University, Department of Archaeology), Olaf Nehlich (Department of Anthropology, University of British), Alan McMillan (Department of Archaeology, Simon Fraser University), Michael Richards (Department of Anthropology, University of British) and Dongya Yang (Department of Anthropology, University of British)

[71] *Using Ancient DNA and Stable Isotopes On Archaeological Cetacean Samples to Investigate Target Species In Pre-Industrial Whaling in Barkley Sound*
Archaeological research can be used to gain important insights on the interaction of humans with their environment, for example hunted species and their natural history. For this study, whale bones from excavations at Barkley Sound were used to investigate the antiquity of whaling and the resources available to early hunters, using ancient DNA and stable isotopes.

Analyses of 264 whale bones revealed 78.8% humpback whales and 13% grey whale followed by other species in low quantities. Humpback whales were analyzed further to study changes in genetic diversity and population size over time. Results suggest a long term stable population frequenting Barkley Sound over four millennia.

Stable isotopes of humpback and grey whales were analyzed to investigate the feeding behavior of these individuals. Isotope results of carbon and sulphur show a very homogenous behavior, whereas nitrogen demonstrates highly variable dietary habits. Results of this study suggests that the whales hunted by Nuu-chah-nulth people for at least 4000 years were likely the ancestral populations of modern whales in the region, based on similar genetic structure and feeding behavior.

This study is an example of how archaeological science can contribute to the investigation of ancient ecosystems, equally supporting archaeological and conservation research.

Arnold, Elizabeth [186] see Madden, Gwyn

Arnold, Philip (Loyola University Chicago)

[275] *Teotepec and a New Tuxtla Prehistory*

Archaeological research at Teotepec, located in the Tuxtla Mountains of southern Veracruz, Mexico, is providing an alternative scenario for the region's long-term politico-economic development. Conventional accounts of Tuxtla's cultural transformations generally emphasize external contact, be it via the southern Gulf Olmec during the Formative Period or Teotihuacan during the Classic Period. Evidence from Teotepec, however, suggests that the western Tuxtla was characterized by a significant autochthonous development. Moreover, evidence is mounting that the influence provided by extra-regional agents has been overstated. This paper employs several lines of data to examine and reassess the impact of foreign interests on Tuxtla prehistory. This evaluation reframes Tuxtla prehistory as one in which local cultural expression were largely consonant with other Gulf lowlands occupations and were only moderately affected by extra-regional contact.

[275] *Chair*

Aronsen, Gary [260] see Brownlee, Sarah

Aronsen, Gary (Yale University), Ana Marichal (Yale University) and Sarah Brownlee (Yale University)

[260] *Osteology of the Yale-New Haven 4: Health, Occupation, and Trauma Biomarkers*

The four skeletons recovered from the Yale-New Haven Hospital construction site show multiple indicators of disease, trauma, and occupational stresses. All four individuals exhibit pathologies and damage associated with manual labor. Dental attrition and calculus accumulation suggest a diet of coarse and starchy foods. The older female possesses unique osteoarthritic changes to the knee that are strongly suggestive of a repetitive activity, possibly a factory-based or other labor-intensive occupation. One male shows multiple healed fractures that likely resulted from a serious fall or blunt trauma, as well as bony changes suggestive of infectious diseases. Two individuals have perimortem trauma indicators. Evidence of cultural activities, i.e. pipe smoking, is also evident.

When viewed in toto, our osteological analysis provides a unique look into the 1850s working class of New Haven – a population overlooked in most history books. We describe the significance of these biomarkers through comparative osteology and in the contexts of industrial, immigrant and historical data for the Northeastern United States. Finally, our results are augmented by collaboration with experts in other fields to further elucidate individual identity, life history, and population/socioeconomic status.

[260] *Discussant*

Aronsson, Peter (Linnaeus University)

[72] *Representing Age in the National Museum*

In this paper age will be in focus using both qualitative and quantitative material to discuss the role this plays both as a dimension in heritage representations and as a strata of the audience. National museums have a prominent standing both as homes for scientifically legitimate and politically sanctioned representation of history and preferred values of taste and community. Museums are visited by citizens, immigrants and tourists of all ages. In a large scale European project, European National Museums: Identity politics, the uses of the past and the European citizen (EuNaMus), comparative research has mapped the meaning and experience of these institutions. The results have so far been discussed mainly in terms of how identity politics act on ideas of nationality, ethnicity and scientific truth. In social and cultural policies the inclusion of young people and minority groups

are targeted. However the rising economic prominence of museums as cultural industries suggests that the elderly need to be conceived not only in terms of physical accessibility but as a distinct and prominent group of stakeholders.

[72] *Discussant*
 [72] *Chair*

Arredondo , Carlos [254] see Roksandic, Mirjana

ARRIAZA, BERNARDO [26] see Standen, Vivien

Arriaza, Bernardo (Universidad de Tarapacá), Vivien Standen (Universidad de Tarapacá, Arica, Chile), Karl Reinhard (University of Nebraska, Lincoln, USA), Jorg Heukelbach (School of Medicine, Federal University of Ceará) and Katharina Dittmar de la Cruz (SUNY, Buffalo, USA)

[272] *Pediculosis capitis in Archaic Coastal Andean Populations of Northern Chile*
 Sixty-three Chinchorro mummies (2000-1500 B.C.) from Arica, Chile were examined for ectoparasites that thrive in crowding conditions. The excellent preservation of mummies permitted to study the degree of infestations by Pediculus humanus capitis which is usually transmitted by head to head contact. An area of 2x2cm² on each mummy's head was systematically inspected for louse nits using a hand held 10X lens. Hairs with nits/eggs and lice were collected and analyzed using optic and scanning electronic microscopy. About 75% (47/63) of the mummies, of all ages and both sexes resulted positive with an average of 8.2 nits per positive individual. Microscopic analyses revealed all developmental stages and micromorphology of the ectoparasite. The results of the analysis were surprising. Louse infestation is a crowd disease and is more associated with large populations. The high prevalence shows that such conditions existed for the Chinchorro. Chinchorro fishermen lived in small huts, which could have contributed to the high prevalence and spread of pediculosis among them. In addition, they likely carried out their daily camp activities in very circumscribed places, which facilitated the transmission of ectoparasites. The prevalence of pediculosis could be a useful bioindicator to debate cultural behavior and paleoepidemiology in prehistoric populations

[272] *Chair*

Arroyo, Barbara (Museo Popol Vuh UFM Guatemala)

[4] *Discussant*

Arroyo, Barbara [186] see Sweeney, Angelina

Arsenault, Daniel (CELAT-UQAM, Montreal, Quebec)

[18] *E=Mco, an Equation for Studying the Timeframes of World Rock Art: Applying the Concept of "Chaine Opératoire" in the Interpretation of a Rock Art Site and Its Setting throughout its Time of Existence*

French lithic-tools analysts were the first to propose the concept of "chaîne opératoire" for the complete studying of a lithic tool's lifespan, explaining its successive stages from the very beginning, when it was intellectually conceived, to when it was finally discarded. Although applied in rock art analysis, the chaîne opératoire has been only used for explaining the different steps leading to the making of a morph or a graphic. Looking at rock art from a different perspective, the author applies this concept to the site as a whole, considered here as a "visual tool" which was conceptualized, made, used and sometimes abandoned. Accordingly, a rock art site is scrutinized following its "chaîne opératoire" process: a) the selection of a proper locus chosen according to a specific worldview, b) the conception of the graphic

(i.e. the motifs to be depicted and their placement on a rock surface), c) the procurement of raw materials and tools used to produce the art, d) the subsequent frequentings of the place, with e) its possible abandonment. Not being simply conceived through its materiality, rock art is therefore defined as the expression (E) of the mind (M) following every step of the chaîne opératoire (Co).

Arteaga, Patricia A. [149] see Jones, Terrah

Arterberry, Jimmy [281] see Mt. Joy, Kristen

Arthur, John (USF St. Petersburg)

[250] *Thunder Teeth (Dada Achay): An Ethnoarchaeological Study of Ground Stones among the Gamo of Southwestern Ethiopia*

Foragers, agriculturalists, and pastoralists have all used a specific tool, the ground stone, to process their food. Thus, the ground stone is an essential transforming tool that has only recently begun to receive its due attention by archaeologists to address issues such as subsistence, trade, and craft specialization. This ethnoarchaeological research focuses on the agrarian, caste society of the Gamo people who live in southwestern Ethiopia and how they procure, produce, and use ground stones. The strict Gamo caste system forces the ground stone makers to rely solely on their craft for a majority of their livelihood. As a result the Gamo ground stone producers are full time craft specialists who procure the stones at specific quarries but also within river valleys. Once the ground stone producers finish their product they carry the ground stones to one of the weekly markets to sell to consumers, who continue to use different types of ground stones for processing grains, seeds, and root crops. Consumer's use of the ground stones also is a reflection of the caste system. Thus, the production and use of Gamo ground stones have specific signatures that can be seen in the archaeological record.

[250] *Chair*

Ashley, Michael (University of California, Berkeley)

[105] *Last House on the Hill: An Archaeological "Multigraph" for the Digital Age*

Last House on the Hill comprises a record of the University of California at Berkeley research project at Çatalhöyük (BACH) from 1997 to 2003. Accompanying the physical monograph published by the Cotsen Institute of Archaeology Press, we developed a digital "multigraph," as we like to call it, whereby all the original data, media, analysis, and interpretation are interlinked with the final synthetic contents held in the monograph. It is available as a "Cloud"-based database running on your desktop and as an iPad application, which brings together digital versions of the published texts and authors' supplemental materials along with the full archaeological record. Last House on the Hill does much more than provide a digital presentation framework for publishing an archaeological monograph. Its ambition, one that we have long wished to satisfy, is to embed, interweave, entangle, and otherwise link the complete project database (including all media formats such as photographs, videos, maps, line drawings) with their interpretation and meaningful presentation in an open access, sharable platform. It is an open-ended datastream that can grow and—as long as it is well curated—can live for many decades. We will demonstrate the platform and invite feedback in this session.

[105] *Chair*

Ashley, Michael [105] see Toffalori, Elena

Ashmore, Wendy (University of California, Riverside)

[61] *State and Popular Ritual at Maya Quiriguá, Guatemala*

As prominent as ritual performance was for cementing authority in Archaic states, community performances oriented more to the populace than the king could be equally important. Such instances, however, are far less often discussed. This presentation considers paired, mutually contemporary observances, royal and commoner, at the Classic Maya polity capital of Quiriguá, in what is now Guatemala. It then draws comparisons with select instances elsewhere in Mesoamerica, including Copan, Honduras, plus the non-Maya polity capitals of Quelepa, in eastern El Salvador, and Gualajoquito, in west-central Honduras. The central argument is that understanding the nature of ritual in Archaic states requires consideration of practices enacted by the range of society's members. Among the questions asked are whether such multifaceted sets of practices are mutually complementary, hint at subordinates' resistance to central authority, or fit other interaction models.

[166] *Discussant*

Asmerom, Yemane [109] see Rissolo, Dominique

Asouti , Eleni [32] see Marciniak, Arkadiusz

Astete, Fernando [200] see Ziolkowski, Mariusz

Astorino, Claudia [22] see Bae, Christopher

Astudillo, Fernando

[1] *Phytoliths, Paleoenvironment, and Human Settlement of the Northern Ecuadorian Andes*
Middle Holocene grassland composition, vegetation dynamics, and ancient terracing in Andean páramos and montane forest were studied based on quantitative phytolith analysis. Paleoecological samples were taken at the archaeological site of Palo Blanco in the highlands of northern Ecuador, which reflect the presence of permanent grass vegetation with changes in its composition. Human impact is observed in the modification of natural slopes creating terraces. Minor changes in the frequencies of grass vegetation of the Panicoideae subfamily suggest a weather fluctuation about 3640 BP. This paper provides a comprehensive overview of the phytolith spectrum present in different levels of the terraces, which can guide future paleoenvironmental research in the Andean highlands.

Atalay, Sonya (University of Massachusetts Amherst)

[169] *Methodological Considerations in Community-Based Archaeology: Participatory Planning and Knowledge Mobilization*
Working in partnership with community members to plan and carry out community-based archaeology and heritage management research presents complex challenges and tremendous benefits. Building on recent research with Native American and Turkish community partners, this paper addresses the challenges and benefits involved in two key areas: participatory planning and knowledge mobilization. Participatory planning can prove effective for developing a research design in partnership with community members. The approach strives to incorporate a wide range of voices and ideas into the planning process. This paper discusses the key steps of participatory planning and how it can be applied to archaeology and heritage management projects. Knowledge mobilization is a key component to community-based research because it ensures that new knowledge is accessible and can be used by communities. A well-developed knowledge mobilization plan ensures that research impacts policy, oftentimes at multiple levels -- international, state, national, and tribal. We demonstrate our use of participatory planning and knowledge mobilization in community-based archaeology and heritage management projects

in Turkey and Native North America; with an emphasis on how these practices contribute to the decolonization of archaeology.

[52] *Discussant*

Athens, J. (International Archaeological Research Institute, Inc.), Timothy Rieth (International Archaeological Research Institute, I) and Tom Dye (T.S. Dye & Colleagues, Archaeologists)

[47] *Evaluating Discrepancies between Paleoenvironmental and Archaeological Estimates for the Colonization of Oceanic Island*

The timing of the human colonization of Oceanic islands can be documented with archaeological and paleoenvironmental evidence. In theory, these two datasets should be complementary, providing generally equal estimates for the arrival of humans. This equivalence is based on certain expectations for founding populations, while also requiring adequate sampling of the archaeological and paleoenvironmental records. Demographic rates, permanency of settlements, environmental impacts of colonization, and geomorphological factors affecting the preservation, and potential discovery, of colonization deposits are some of the factors to be considered. For certain islands, in practice there is a discordance between these lines of investigation in estimating colonization, with discrepancies of centuries to nearly a millennium. We present a review of the paleoenvironmental and archaeological evidence from Guam, Palau, and Hawai'i as case studies for addressing instances of discrepancies in colonization estimates. We assess methodological issues for identifying a human presence in wetland sediment cores, age extrapolations for these cores, and geomorphological and sampling issues for discovering early archaeological deposits. Our analysis suggests that these independent datasets should be evaluated in an iterative manner to provide a more precise and accurate estimate for the arrival of humans in island environments.

Atherton, Heather (Columbia University)

[134] *Desert Islands: Frontiers of Isolation in Colonial New Mexico*
Like islands, frontiers are conceived of as bounded spaces and are often viewed as far-off and isolated places. Frontiers also serve to demarcate the edge of a territory, such as a nation or empire. Despite their role as border for a region, frontiers are recognized as being somewhat permeable and fluid as well. Taking island studies as my muse, this paper considers the movement of goods and people across the northern borderlands of New Spain. In particular, I draw upon data from rural villages in the colonial province of New Mexico. Charting the flow of goods and people into and across this desert "island", I explore notions of locality and how they lay in opposition to what was perceived of as foreign as well as administratively distant.

Atici, Levent [3] see MacIntosh, Sarah

Atici, Levent (University of Nevada, Las Vegas) and Burçin Erdogu (University of Thrace, Turkey)

[263] *Zooarchaeology of the Neolithization of Europe: New Evidence from Uğurlu Höyük, Gökcada, Turkey*

The revolutionary transformation of societies from foraging to farming in Southwest Asia and the subsequent spread of emerging economies into Europe via a process called Neolithization have been one of the most enduring research agendas in archaeology. Currently, archaeologists approach the Neolithization of Europe from a dichotomized perspective using two competing models: the "wave of advance" model postulates that people advanced on an

East-West axis with their ideas and technology, as well as their crops and livestock, gradually colonizing Europe. The "leapfrogging" model argues the advance of small, maritime populations following a coastal route hopping from island to island. Uğurlu Höyük is a Neolithic settlement on Gökçeada, the largest Turkish island in the Aegean Sea, and currently the only site with an early Neolithic component found in the eastern Aegean and between Southeast Europe and Southwest Asia. As such, Uğurlu Höyük sheds new light on and significantly contributes to our understanding of the development of agricultural societies in Southeast Europe. In this presentation, we focus on material culture and animal exploitation strategies at Uğurlu Höyük and add new data to research in Neolithization of Europe.

Auble, Brent (George Mason University)

- [36] *Exploring the Development of Complex Civilization in Ancient Peru Using an Agent-Based Model*

The expansion of the population along the river valleys from the Pacific Ocean up to the Peruvian Andes has been posited as a driver of increasing social complexity. In this study, a preliminary agent-based model (ABM) has been developed that explores the development of an initial fishing village along the ocean at the mouth of a river based on population growth and increasing needs for diverse resources. The model shows theoretically that expansion up the river valleys could be explained by increasing population size and resource requirements, and may help shed some light on whether this is consistent with Moseley's Maritime Foundations Hypothesis.

Aufderheide, Arthur [50] see Brown, Emma

Auge, C Riley (University of Montana), Mary Bobbit (University of Montana), T.A. Foor (University of Montana) and Kelly Dixon (University of Montana)

- [120] *Indigenous Uses of Non-traditional Artifacts at a Mid-Fraser Village*

At the end of the 18th century, British, French, and Russian fur traders made first contact with the indigenous Pacific Northwest inhabitants. Through networks of direct and indirect trading interactions, objects of European design and manufacture steadily became components of Pacific Northwest native people's material culture. The introduction into indigenous cultures of new materials for traditional technologies (e.g., metal projectile points) and the presentation of novel objects (e.g., horseshoes, mirrors) surely affected traditional behavior. However, as has been documented in other culture contact contexts, the adoption of non-traditional materials and objects often resulted in adapting those forms physically or ideologically to correspond with traditional modes of meaning. By examining a small group of 18th-19th century artifacts excavated during the 2012 fieldwork from House Pit 54 of the Bridge River Site (EeR14) in British Columbia under the direction of Dr. Anna Prentiss, we consider multivalent interpretations to better understand how native people appropriated non-traditional material culture to function within their own cultural framework.

Auge, C. Riley [120] see Bobbitt, Mary

Auguiste, Irvince [292] see Hofman, Corinne

Austin, Anne [129] see Simpson, Bethany

Aveni, Anthony (Colgate University) and David Stuart (University of Texas)

- [21] *Calendrics, Astronomy, and Math at the "Xultun Institute of Advanced Study"*

We can be sure that the discovery of the complex of numbers

painted in the codex style on the walls of Str. 10K2 at the Classic Maya site of Xultun, Guatemala deal with calendrical, astronomical, and numerological computations of the kind found in the much later codices. This offers us an opportunity to generate testable hypotheses, based on the considerable body of knowledge about the codices, regarding the ends served by these remarkable numbers. In this presentation we present further information gleaned from these numbers since our publications in 2012 and we discuss some of the new ideas we have been considering.

- [166] *Discussant*

Awe, Jaime [171] see Horn, Sherman

Ayres, William [244] see Seikel, Katherine

Ayres, William (University of Oregon)

- [244] *Discussant*

Babcock, Thomas

- [140] *Utatlán: The Postclassic Community of the K'iche' Maya*

Archaeological interpretations of spatial organization and social stratification of the late Postclassic K'iche' Mayan center of Utatlán, Guatemala are presented. The K'iche' ruling elite were purported to be Mexicanized Mayans from the Gulf Coastal area of Mexico, migrating to the highlands following political changes at Chichén Itzá. Ethnohistorical records have been interpreted to suggest a dual kingship and both tripartite and quadripartite components in the political and social organization of the K'iche'. These may also have been present at Chichén Itzá and at Tayasal. A royal burial excavated at Utatlán may attest to a dual kingship.

The non-local elite dominated an indigenous K'iche' population. This indigenous group comprised a spatially segregated commoner population of the city. Archaeological evidence indicates commoner houses conformed to a template that predated founding of the late Postclassic city by over 700 years, and their use continued unabated for nearly 300 years after incorporation into the Postclassic city. This city had an elite epicenter with an adjacent lower-level elite zone, separated by a barrier from the commoner zone, and had an entry fortification. This may mirror the spatial arrangement of the Kaqchikel Mayan center at Iximché.

Bachelet, Caroline

- [103] *Wood exploitation in the "Cidade de Pedra" (Rondonópolis, Mato Grosso, Brazil) from the Middle Holocene: An Anthracological Analysis*

Research in southern central Brazil, in "Cidade de Pedra" (Rondonópolis, Mato Grosso) revealed a significant prehistoric sequence settlement dating from the mid-Holocene to late Holocene. The diversity of materials so far discovered attests to the presence of several groups: first, pre-ceramists, and then, ceramists from 2800 years BP, when the first ceramic sherds at the Ferraz Egreja site appeared. In each of the excavated sites, the large quantity of combustion remains testifies the use and exploitation of wood by men. This work presents the first results of anthracological analysis performed from vestiges of hearths, firebrands and charcoal concentrations collected in four habitat sites throughout this chronological period. By approaching paleoethnobotanical and paleoecological issues, this paper provides the first data on the regional paleovegetation and human behaviors in regarding wood collection resources for the last 5000 years.

Backes, Clarus [288] see Cheetham, David

Backo, Heather (Tulane University) and John Verano (Tulane University)

[57] *The New Temple and Temporal Continuity in Human Sacrifice at the site of Moche, Peru*

Excavations at the site of Moche, on the northern coast of Peru, have revealed a late period ceremonial structure designated Platform III, or the New Temple. This temple postdates the use of the larger Huaca de la Luna and represents a shift in ceremonial activities at the site. There is now evidence for continuity, however, in the practice of prisoner sacrifice persisting at this later ceremonial structure. Multiple clusters of human skeletal elements, representing several individuals, have been excavated from windblown sand with no evidence for severe pluvial episodes. Similar to the prisoner sacrifices of Huaca de la Luna, all are male with abundant perimortem trauma, including cut marks related to dismemberment, defleshing, and decapitation. Also found among the remains is the earliest existing example of chest opening related to ritual activity on the north coast of Peru.

The New Temple is currently the only known late Moche to Transitional period site with skeletal evidence for the continuation of prisoner sacrifice. Although unique in this context, the New Temple reflects ritual continuity between the earliest to final Moche occupation at the site, and possibly into later period sites, such as Pacatnamu, as reflected in the practice of chest opening.

Bae, Christopher [22] see Lee, Chulmin

Bae, Christopher (University of Hawaii at Manoa)

[22] *Late Pleistocene Hominin Fossils from Ryonggok (Democratic People's Republic of Korea): Linear and Geometric Morphometric Perspectives*

Ryonggok Cave, located near Pyongyang (Democratic People's Republic of Korea), is perhaps the most important Late Pleistocene hominin fossil locality in the Korean peninsula. Numerous hominin fossils were found, representing at least five individuals. The hominin fossil assemblage includes two relatively intact crania, several mandibles, and a series of postcranial remains. The focus of the present study is the two relatively complete crania (#3 and #7), with the goal to determine which hominin taxon these Korean fossils might be most appropriately allocated to. Comparative data were collected on a series of human skeletons from Chosun Dynasty (1392-1897 A.D.) cemeteries in the Republic of Korea and on a range of modern human and casts of hominin fossils (e.g., *Homo erectus*, *H. neanderthalensis*, Upper Paleolithic modern humans) stored in the American Museum of Natural History. A series of linear and geometric morphometric (GM) data were collected directly on these casts and modern human specimens. Results from principal component and discriminant function analyses suggest the Ryonggok hominins might be more closely aligned with modern humans than fossil hominin taxa. Implications of these results are discussed as well as the chronometric age of the Ryonggok hominins.

[22] *Chair*

Bae, Kidong (Hanyang University, Korea)

[22] *Discussant*

Baichtal, James [167] see Moss, Madonna

Baierlipp, Michael [125] see Kaufmann, Kira

Bailey, Geoff

[215] *Dynamic Landscapes as Agents of Human Evolution and Dispersal*

The notion of 'landscape', with its emphasis on the spatial dimension of human activity, and as the effective arena of social and ecological interaction and human adaptation is a powerful one. However, the immense geochronological and geomorphological challenges of reconstructing the physical landscape settings in the Pleistocene have deterred investigation of this key variable. The difficulties are compounded by the fact that regions with the greatest concentration of early finds are active geologically, because of high levels of tectonic activity or other instabilities such as sea-level change and crustal deformation. Landscape reconstructions are especially difficult in such regions, and relationships with human activity are further obscured by the all-pervasive problem of differential visibility and preservation. We argue that the inherently dynamic nature of these unstable landscapes has made them powerful agents of biological and social change, selecting for, stimulating, obstructing or accelerating the latent and emerging properties of the human evolutionary trajectory, provide examples in support of this idea, and assert the importance of pursuing a research agenda of multiscale landscape reconstruction if we are to understand fully the role of environmental, ecological and climatic changes in human evolution.

[49] *Discussant*

Bailey, Laura and Catherine Johns

[119] *Materiality of Energy: Mass Consumption Issues in Material Culture on Public Transit*

Archaeologists have often considered their task to be the delineation of shifting adaptations over time, based either on the systemic or individual advantages of different behaviors and technologies. Yet attempts to understand the processes that have led to adaptations often remain obscure in archaeological contexts. In order to address this broader problem an ethnoarchaeological and historical analysis of the Denver public transportation system and its predecessors was conducted, with special attention being paid to the current Light Rail system. We examine the shifts between public and private forms of transportation during the 20th and 21st centuries in Denver and elsewhere, pointing out the role of population growth and changing economical situations as being the principal motivator in bringing about technological change. A series of interviews among current Light rail passengers uncovered five main reasons for using this form of public transportation, most of which could be considered an adaptation to modern stressors. This study therefore contributes to archaeological studies of the agency of adaptation to population growth.

Bailey, David B. [120] see Hill, Katherine

Bailey, David (Hamilton College), Lyman Munschauer (Hamilton College), Nathan Goodale (Hamilton College) and Catherine Prescott (Hamilton College)

[186] *Building a Geologic Database of Potential Lithic Artifact Sources in the Upper Columbia River Drainage, British Columbia: Preliminary results*

Lithic artifacts provide information not only about a people's daily activities, but also about their geographic mobility. This study examines the lithic artifacts associated with the Slocan Narrows Pithouse Village, a community located within the Upper Columbia River system dating to c.a.3100-250 cal B.P. While a wide range of geologic materials were used by these people in the past, many tools were made from very fine-grained, dark gray to black, volcanic rock. In an attempt to locate potential sources for this portion of the artifact assemblage, the authors identified the geographic locations of known volcanic rocks within the traditional

boundaries of the Sinixt/Arrow Lakes people. Sixty-four potential source samples were collected from an area spanning approximately 300 km². Petrographic and chemical analysis by portable XRF and WD-XRF will be used to characterize and define the different volcanic rock units within this region. Artifacts from the site will then be chemically analyzed using an Innov-X portable XRF unit and, if possible, assigned to the corresponding source locality.

Bair, Daniel [207] see Terry, Richard

Baird, Douglas [3] see Fairbairn, Andrew

Baitzel, Sarah (UC San Diego)

- [238] *Before and After: Burials and the Reuse of Ceremonial Space at the Omo M10 Temple, Moquegua, Peru*

The placement of human burials in monumental architecture during episodes of (re-)construction and abandonment has been documented in many regions of the pre-Hispanic Andes, including the capital of the highland Tiwanaku state (A.D. 500-1000). Previous research at the provincial Tiwanaku ceremonial center Omo M10 in the Moquegua Valley of Southern Peru has documented the presence of Tiwanaku interments in one of the lateral temple platforms, known as M10B. Recent excavations cast new light on the original nature and function of this monumental substructure, and address the questions of when and why it was transformed into a burial space. Data from the initial construction and subsequent mortuary occupation of this sector of the Omo temple elucidate the temporal and functional relationships between platform and cemetery, of ceremonial spaces and mortuary monuments.

Balamaseda, Jorge [234] see Lailson Tinoco, Becket

Balanzategui, Daniela (Simon Fraser University)

- [1] *Colonial Indigenous and Mestizo Foodways: Ceramic Analysis and Ethnoarchaeology in the Highlands of Ecuador*

Archaeological approaches regarding cultural change or continuity after the Spanish conquest of America have been focused on presenting proportions of European (majolica) vs. Indigenous (coarse earthenware) ceramic styles. This thesis provides a reconstruction and quantification of vessel forms from an 18th century household (Riobamba, Ecuador). The results are compared with inventories and interviews from ten modern Indigenous and Mestizo households in the Highlands of Ecuador, in order to understand colonial food preparation and consumption traditions. Testing colonial practices, this work proposes that Mestizo population has been politically situated to practice European foodways to maintain social status and reinforce their separation from Indigenous people. Indigenous people intentionally continue local traditions of communal feasting with the use of large pots to express their identity. The theoretical implications of these findings shed light on a complex combination of domestic practices as builders of negotiable ethnic identities.

Balco, William (University of Wisconsin-Milwaukee)

- [25] *Compositional Analysis of Indigenous Iron Age Pottery from Western Sicily: From Challenge to Interpretation*

Pottery production and exchange remain popular foci of post-excavation materials analysis research in western Sicily. Few studies however, explore Iron Age Sicilian pottery from a compositional perspective. Exportation issues, materials preservation, and budget constraints have limited the scope of compositional studies and largely confined interpretations to the results of stylistic evaluations. Unlike previous, destructive

compositional analyses of Mediterranean pottery, non-destructive techniques facilitate the study of pottery while maintaining high curation standards. This paper presents a viable non-destructive method for analyzing pottery from the seventh through fourth centuries BC using a portable x-ray fluorescence (pXRF) instrument. Challenges such as transporting the instrument internationally and overcoming electrical current fluctuations are discussed. The results of this study suggest that pXRF instruments can be successfully employed in urban as well as remote rural settings. The resulting pXRF data was used as a complement to more traditional stylistic and morphometric analyses. The combined data set allows a more focused examination of the production and exchange of Iron Age western Sicilian pottery within the context of the ancient Mediterranean economy.

Ballard, Chris (Australian National University)

- [292] *The Encounter of Historicities*

As Marshall Sahlins and others have demonstrated, historicities, or cultural logics of temporal process, play a critical role in cross-cultural encounters. On either side of the encounter, they guide the anticipation of novelty and structure subsequent reflection on events and the constitution of historical narratives. But, in the course of encounters, these historicities are themselves put at risk, or laid open to the possibility of transformation; the fundamental tenets of cosmological process and temporality are exposed to radically different conceptions of the past and the future. Acknowledging the cyclical flow of inspiration between Melanesian and Central and South American history and anthropology, and drawing on particular events in the 16th-century Caribbean and the 20th-century Pacific, this paper explores the consequences of encounters between strongly contrasting historicities, and the production of commensurable forms of historical consciousness.

Ballenger, Jesse [116] see Zedeño, María

Ballenger, Jesse (Statistical Research) and Jonathan Mabry (Historic Preservation Office, City of Tucson)

- [291] *Temporal Frequency Distributions of Alluvium in the American Southwest: Taphonomic, Paleohydraulic, and Demographic Implications*

The use of radiocarbon frequency distributions to reconstruct prehistoric human and animal populations must account for taphonomic loss and other factors. Researchers recently proposed a correction for "taphonomic bias" that is based on the radiocarbon frequency of a global sample of volcanic deposits. Analysis of radiocarbon dates sampled from the alluvium of the San Pedro and Santa Cruz rivers and their tributaries in southeastern Arizona shows that discovery and scientific biases also play an important role in the creation of radiocarbon frequency distributions, and that the rate of "taphonomic bias" in prehistory is not predicted by the radiocarbon frequency of volcanic deposits.

Ballensky, Tamara [109] see Brady, James

Ballsun-Stanton, Brian [185] see Crook, Penny

Balme, Jane and Sue O'Connor (Australian National University)

- [227] *Traditions and Change in Scaphopod Shell Beads in the Southern Kimberley, Australia from the Pleistocene to the Recent Past*

Shell beads were made in Australia from about 35,000 years ago. They include perforated marine gastropods and intentionally fractured segments of scaphopod. In the southern Kimberley scaphopod beads are found in both Pleistocene and Holocene contexts. While some of the oldest examples are in archaeological sites which were close to the Pleistocene coastline in the southern

Kimberley, they are also found in sites which were over 500 km distant at the time of their deposition. This suggests that they were traded or exchanged "down the line." Historic photos and ethnographic evidence reveal that in the recent past such beads were worn as strands and as hair adornments by Indigenous people in coastal locations. There is no record of their use in the inland regions perhaps suggesting that they were used differently in inland locations or a break in traditional use. Here we look at some of the features of the beads from a number of Kimberley sites and speculate on the nature of the distribution networks over time.

Bamforth, Fiona [77] see Moussa, Nour

Bane, Barbara [91] see Bane, Barbara

Bane, Barbara (National Park Service) and Barbara Bane (National Park Service)

[91] *Last Flight of a Nighthawk: The Recovery of Threatened Armament at a WWII Plane Crash Site in Yosemite National Park, CA*

In April 1944, an Army Air Corps P-70 Nighthawk fighter plane on a night flight mission crashed in Yosemite National Park, CA. While the Army removed pilot remains and sensitive military equipment later that year, extensive portions of the burned plane remained at the crash site in the park's remote backcountry. This paper describes the park's efforts in 2012 to relocate the site, document the archeological site, and retrieve the plane's armament by mule train when threats of looting appeared on social media websites.

Banks, Kimball [125] see Green, Debra

Banning, EB [58] see Hitchings, Philip

Baran, Ania [266] see Wilkerson, Emily

Barba, Fabio [17] see Escoria, Lilia

Barba, Luis (Universidad Nacional, Autonoma De Mexcio), Agustín Ortiz (IIA, UNAM), Jorge Blancas y (IIA, UNAM) and David Carballo (Boston University)

[231] *Detección de Estructuras Arqueológicas Enterradas y Determinación de Áreas de Actividad en La Laguna, Tlaxcala*

Desde hace más de tres décadas nuestro laboratorio ha establecido una metodología para el estudio de sitios arqueológicos. Dicha metodología incluye fotografía aérea, topografía con GPS, estudios de gradiente magnético, resistividad eléctrica, geo-radar y el análisis químico de los pisos excavados para la determinación de áreas de actividad. Mediante un acuerdo de colaboración esta metodología ha sido utilizada con éxito en el sitio La Laguna Tlaxcala. La Laguna ha sido considerado como el sitio de mayor tamaño en el norte de Tlaxcala durante la segunda parte del Formativo (c. 600 a.C. – 100 d.C.), y ha tenido varias etapas previas de estudio. Como parte del proyecto dirigido por David Carballo desde 2008, se han excavado varias estructuras localizadas previamente mediante estudios geofísicos: un juego de pelota, un altar central en la plaza (E-12L-5), basamentos piramidales como las (E-12L-1 y la 13M-1), así como una zona de producción y probablemente habitacional denominada como Estructura 12M-3 a y b respectivamente y cuyos resultados son parte importante de la presente ponencia. El estudio incluye la detección de residuos químicos en las muestras obtenidas al perforar el piso de manera sistemática, siguiendo la retícula de excavación.

Barber, Sarah (University of Central Florida), Arthur Joyce (University of Colorado at Boulder) and Jeffrey Brzezinski (University of Colorado at Boulder)

[78] *Recent Excavations at the Rio Viejo Acropolis, Oaxaca, Mexico*

With a volume conservatively estimated at 455,000 m³, the Rio Viejo acropolis was one of the largest monumental facilities in pre-Columbian Oaxaca. As originally built, the acropolis consisted of a series of earthen substructures that reached between 7 and 17 m above the ancient floodplain of the nearby Río Verde. Much of the acropolis was built during the late Terminal Formative period (A.D. 100 and 250); the area was largely abandoned during the Early Classic period (A.D. 250 – 500), and then was reoccupied in the Late Classic period (A.D. 500 – 800). Excavations conducted in 2009 and 2012 on the acropolis have clarified current understanding of how this monumental space was constructed, used, and ultimately abandoned. Results indicate that much of the acropolis was built in a few brief, massive construction episodes rather than cumulatively over an extended period. Formative period activities on the acropolis included feasting and intensive burning, probably for very large-scale food preparation. Later activities, including those of the Late Classic period, appear to have been commemorative until the acropolis was occupied for domestic use at the end of the Classic or beginning of the Postclassic.

[78] *Chair*

Barber, Sarah [133] see Joyce, Arthur

Bardolph, Dana (University of California Santa Barbara), Brian Billman (University of North Carolina Chapel Hill) and Jesús Briceño (Ministerio de Cultura del Perú)

[70] *Gallinazo Phase Foodways in the Moche Valley of North Coastal Peru: New Research Directions and Paleoethnobotanical Evidence*

This poster presents paleoethnobotanical data from a coastal Gallinazo Phase (0-200 A.D.) settlement in the middle Moche Valley of north coastal Peru. With most archaeological research devoted to the subsequent Moche period, relatively little focus has been given to the Gallinazo Phase. This period is particularly interesting as it is linked to a variety of cultural issues, including a complex set of interactions, tensions, and influences that accompanied the population movements, subsistence trends, and changes in architecture and ceramics apparent in the archaeological record prior to the consolidation of the Southern Moche polity. To date, no macrobotanical analyses have been conducted from Gallinazo Phase sites that were systematically sampled with modern recovery techniques for paleoethnobotanical remains. This poster presents preliminary results from an analysis of flotation samples from West Cerro León (MV-224), a defensive coastal Gallinazo Phase settlement, as part of establishing baseline subsistence data for comparison with other sites in the Moche Valley. Data from this study will be used to address future research questions related to agricultural intensification, place-based foodways, and highland-coastal interaction that profoundly shaped the prehistory of the region.

Barham, Anthony (Australian National University), Philip Hughes (HEH Pty Ltd and Australian National University), Marjorie Sullivan (HEH Pty Ltd and Australiannational University), O'Connor Susan (Archaeology and Natural History, Australian Nation) and Faulkner Patrick (University of Queensland)

[224] *Geoarchaeological Advances in Identifying Shell "Scatters" As Middens Located on Tropical Shorelines Influenced by Catastrophic Marine Inundation Events (Cyclones and Tsunamis)*

Identifying small deposits of shell as either a product of human food discard (middens) or the geomorphological product of wave reworking of shell-rich intertidal facies (e.g. cheniers) can be challenging. Extra interpretive difficulty occurs on coasts utilized by shell-collecting indigenous hunter-gatherers where landforms were, and still are, subject to episodic Catastrophic Marine Inundation Events (CIMES) e.g. cyclones and tsunamis. Failure to assess the origin of a shell "scatter" unequivocally, with strong evidential basis, may be far-reaching in terms of legislative compliance.

The paper presents results from "mixed-method" laboratory-supported geoarchaeological field investigations on low elevation macrotidal coastlines in Western Australia (WA). In the Pilbara, mining development impacts geologically old shorelines overlain and on-lapped by Holocene sedimentary veneers. Robust identification of the process origin of shell scatters is needed a) for heritage compliance ahead of infrastructure development and b) to improve risk assessment and design durability of the infrastructure once built with respect to storm inundations. Case studies show how utilizing ¹⁴C age-cohort analysis of sites combined with local facies architecture models yield substantially improved insights into the origin, antiquity and depositional history of shell "scatter" sites on these coasts with implications for sites on CIME-influenced Indian and Pacific shorelines.

Barker, Alex (University of Missouri)

[30] *Stealing Fire: Processualism, Abduction, and the Reconstruction of Meaning in Prehistory*

Studies of iconography and the recovery of meaning in prehistory tend to be speculative, offering neither a significant degree of rigor nor opportunities for other scholars to examine the logical entailments and inferential integrity of the arguments proposed. But while signs are arbitrary, the relationship between signs in a symbolic system are not, allowing processualist approaches to the interpretation of meaning. Using Peirce's abductive inference a method is explored for developing iconographic interpretations which may be more rigorously assessed, allowing scholars to choose among alternative explanations or reconstructions by considering the explanatory power of the proposed reconstruction when applied to additional parts of the corpus. While any given sign may be polysemic, a method for assessing the validity of proposed interpretations should allow scholars to elucidate one or more meanings in a more systematic manner—and offering the potential to understand not only what but also how symbols mean.

Barna, Benjamin (University of Nevada, Reno)

[73] *Investigating Pili at Laumai'a: A Hawaiian Metaphor for Cultural Hybridity among Nineteenth-Century Ranchworkers*

During the nineteenth century, the nascent Hawaiian ranching community coalesced out of Hawaiians and immigrants from Europe, Asia, and the United States into a distinctive, culturally-hybrid paniolo cowboy subculture. The ranching community served as a kind of cultural refuge, retaining the use of the Hawaiian language and other practices when foreign colonial powers sought to assimilate Hawai'i's multiethnic population to their own Western ways. At the same time, the paniolo community borrowed and adopted aspects of the lifeways of the immigrants who joined their ranks. The usual acculturation models of "melting pots" and "salad bowls" fail to describe the decades-long process of ethnic integration on Hawai'i's ranches. This paper proposes instead that the ethnogenesis of the paniolo community can be explained through the notion of pili, a Hawaiian metaphor invoking mixing, relatedness, and ancestry. Evidence from two ranching cabins at Laumai'a on the Island of Hawai'i is used to illustrate how this metaphor describes the roles that ranch work and management practices played in the ethnogenesis of a culturally-hybrid occupational community.

[73] *Chair*

Barnard, Hans (Cotsen Institute of Archaeology at UCLA) and Willeke Wendrich (Department of Near Eastern Languages and Cultures)

[129] *The Problems and Possibilities Of Preserving the Mud-Brick Structures of Kananis (Fayum, Egypt)*

Apart from its two temples build of local stone, the buildings in the city of Karanis (northwestern Egypt) are mostly constructed out of mud-brick (adobe). During large-scale excavations at the beginning of the 20th century many of the ancient buildings were exposed and left standing 2-3 stories high. Wind erosion, the decay of organic materials, and the robbing of usable items have since reduced most of the excavated structures down to their foundations. Studies of the local climate, the ancient architecture and building techniques, and the mud-bricks themselves have been initiated in an effort to better understand and possibly retard the deterioration of the city. Selected parts have already been reburied and plans to construct a replica of one of the ancient structures for visitors to experience instead of the vulnerable originals are in an advanced preparatory stage. The first and second phases of the creation of a visitor's center were implemented in the winters of 2011 and 2012, respectively.

Barnes, Kelli (BLM Owyhee Field Office), Nicole Misarti (Water and Environmental Research Center, UAF), Bruce Finney (Dept. of Biological Sciences, Idaho State U.) and Herbert Maschner (CAMAS/IMNH, Idaho State University)

[45] *The Shell Game: Exploring Ancient Human Ecosystems Using Stable Isotopes from Marine Shells*

Carbon, nitrogen, and oxygen stable isotopes from a variety of marine shellfish species were examined from both archaeological and modern contexts. We assessed a range of factors accounting for isotopic variability including spatial, temporal, preservational, and methodological, in addition to fractionation differences between shell and soft tissue organics. Certain species have a greater potential for retaining diagnostic organic carbon and nitrogen isotope values in the archaeological record; thus making them better candidates to help reconstruct lower trophic levels of ancient food webs. Additionally, the use of oxygen isotopes in examining patterns of climate change is well established and of increasing importance to understanding effects of global climate on past and present island populations. Samples were collected from several locations around Sanak Island, Alaska and analyzed at the Idaho State University CAMAS lab using an isotope ratio mass spectrometer. Methods and results for limpets, periwinkles, chitons, and urchins are discussed in relation to regional climatic changes and localized resource use by ancient Aleuts. Variations in local climate and productivity affect human exposure to risk and influences technological innovations observable in the archaeological record. Shell isotope studies can help us to address such questions at a relatively fine spatial and temporal scale.

Barnett, Kristen [120] see Hamilton, Phillip

Barnett, Kristen

[127] *Beyond Ecology: A Look at Demographic Change through Women's Reproductive Choices*

Theories of demographic change have long been predicated on ecological conditions associated with access to food resources. I argue that, throughout time and space, while demography may be impacted to varying degrees by ecological context, it is a human universal that population is always informed by women's reproductive choices. In an attempt to understand the social, economic and demographic impacts of women's reproductive choices, I take a close examination of Housepit 54 at the Bridge River Village, located in the Mid-Fraser Canyon on the X'wisten Reserve, BC. It is clear that within this house both women and children had significant influences on the organization of space. I draw on spatial analysis of archaeological materials and

paleoclimate reconstruction to develop a model designed to measure the degree to which women's decisions regarding reproduction, child rearing relate to the wider environmental, demographic, and socio-cultural contexts.

[127] *Chair*

Baron, Joanne (University of Pennsylvania) and Caroline Parris (Tulane University)

[241] *"You Must Carry Them, Feed Them, and Eat With Them": Precolumbian Patron Deity Veneration and its Modern Parallels*

Many modern communities in Mesoamerica are named for Catholic saints believed to serve as their patrons and protectors. These patron saints were introduced by the Spanish clergy in the Colonial period after Spain's conquest of the New World. But many practices of patron saint veneration have parallels to pre-Columbian patron deity veneration. These include large-scale celebrations in which community members shared food and drink with deities and with one another. The notion of feeding the gods is reflected in both modern and ancient discourses as well as in the archaeological record. In this paper we will discuss these food-sharing practices of modern communities in Mexico and Guatemala and discuss archaeological evidence for analogous practices at the Classic period Maya site of La Corona, Guatemala.

Barone, Pier Matteo (University of Roma Tre/American University of Rome/Forensic Geoscience Italy), Carlotta Ferrara (Physics Dept. - University of Roma Tre), Elena Pettinelli (Physics Dept. - University of Roma Tre) and Adam Fazzari (Sensors & Software, Inc)

[135] *Forensic Archaeology and Forensic Geophysics: A Very Useful Joint Effort*
Forensic Archaeology can be defined as "the application of archaeological theories and recordation and recovery methods to processing of criminal scenes" (Crist, 2001). Beside this forensic expertise, Forensic Geophysics is a useful and complementary science used for forensic purposes. It studies, searches, localizes and maps buried objects or targets (from weapons or metallic barrels till human burials and bunkers) beneath the soil or the water, using geophysics tools. Geophysical methods have the capability to aid the research and the recovery of these targets, because they can investigate large areas non-destructively and rapidly where a suspect, illegal burial or, in general, a forensic target was tried to hide in the subsoil. The Ground Penetrating Radar (GPR) is one of the most useful geophysical tools able to investigate targets beneath the soil (Annan 2004).

The aim of this paper is to highlight not only the potentiality of both forensic approaches together, but also in which way they could be helpful during the forensic investigations, in terms of high-quality results and fast acquisition. These are very useful sciences, but it is necessary to know the principles and the procedures to obtain best results.

Barr, William (University of Texas at Austin), Tomislav Urban (Texas Advanced Computing Center - University of Texas) and Denne Reed (University of Texas at Austin)

[10] *A Comparison of Ontologies and Data Schemas in Paleolithic Archaeology*
Data standards provide a framework for data sharing and can comprise logical ontologies and data schemas. Ontologies provide the logical framework that describes the (often hierarchical) relationships between entities and classes of things, while data schemas provide stable lexicons for referring to those entities along with information about the format in which the information is stored. In this paper we present a comparison of the ontologies and data schema used by a range of archaeological research projects in order to identify the most common ontological relationships and the most useful and prevalent terms used in data schemas. This survey provides the starting point for creating a root

set of terms and relationships suitable for a data standard in paleolithic archaeology.

Barreto, Dr. Cristiana (Museu de Arqueologia e Etnologia)

[60] *Beyond Pots and Pans: Ceramic Style and Iconography in Precolonial Amazonia*

This paper will discuss the regional distribution of ceramic styles and iconographic themes in the Amazon just before European contact. It addresses the role of ceramic imagery in the shaping of territoriality, exchange networks, and multiethnic interaction in both Central and Lower Amazon. It argues that in the Amazon, ceramic objects such as figurines, funerary urns and ritual vessels were part of a wide repertoire of technologies of communication and social interaction which played a major role in both reinforcing cultural identity and validating social formations through specific symbolic contents.

Barrett, Thomas (SWCA) and Ron Kneebone (USACE Albuquerque District)

[275] *Obsidian at Teotepetec: Preliminary Results and Historical Perspectives*

Preliminary archaeological analysis of excavated obsidian from Teotepetec is presented and compared with data collected and analyzed nearly two decades ago from the same site, as well as its regional neighbors. First, this paper explores the patterning evident in the recent data and seeks to relate it to the structure and operation of the prehispanic obsidian craft industry as postulated by previous researchers, and specifically, the political-economic paradigm promulgated by Robert Santley. In light of recent research in the Tuxtla, the role of Matacapan, and indeed Teotihuacan, within the obsidian production-distribution system for raw materials and finished products must be reassessed. Finally, a re-orientation of our perspective on the obsidian craft industry in the Tuxtla is suggested, one that emphasizes specifically intra-regional behavior, ranging from utilitarian tool production to specialized ritual consumption, and that will finally and fully complement the foreign focus of the past twenty years.

Barrientos, Gustavo (Facultad de Ciencias Naturales y Museo, Universidad Nacional de La Plata) and Juan Bautista Belardi (Unidad Académica Río Gallegos, Universidad Naciona)

[26] *Patterns and Processes of Holocene Hunter-Gatherer Diversification in Southern Patagonia*

Historical and ethnographic accounts refer to the existence of two different hunter-gatherer lifeways in the southern extreme of South America at the time of the European arrival: a) terrestrial hunter-gatherers, distributed in most of the inland environments of Patagonia and Tierra del Fuego; b) maritime (canoeists) hunter-gatherers, spread along the western and southern coast of continental Patagonia and Tierra del Fuego. Archaeological evidence, however, suggests a greater diversity, raising questions about how much variation in foraging lifeways was likely present during the Holocene and if such variation would be properly fitted into an adaptive radiation model. Bioarchaeological data shows that an adaptive radiation hypothesis cannot be supported due to the polyphyletic origin of the populations involved and the rather moderate character of the documented pattern of adaptive diversification observed in Fuego-Patagonia throughout the Holocene. In particular, a major north-south population dispersal event likely involving some degree of replacement may have taken place at around 3000 14C years BP. The aim of this presentation is to explore the archaeological record of the land strip between 44°-54° of southern latitude in search of evidence about changes in technology and land use patterns that could be putatively linked with this population event.

Barry, Jack (Trent University) and Gyles Iannone (Trent University)

[290] *Spatially and Socially Conceived Borderlands: A View from the Ancient Maya Center of*

Minanha, Belize

The reconstruction of polity boundaries is essential to the study of dynamic processes that shape and change socio-political institutions in early state societies. The difficulty in studying boundaries archaeologically is well documented, and in the Maya subarea researchers have often relied upon artificial mathematical models, as well as epigraphic data and other historical sources of information to inform their models. More recently, the analytical powers of Geographic Information Systems (GIS) have been utilized to model socio-political boundaries, but with mixed results. In this paper, the ancient Maya center of Minanha, Belize, is used as a case study to present a conjunctive approach as a way to address community boundaries and territoriality of a frontier polity. GIS-based viewshed analyses and cost path analyses are tempered with archaeological material correlates and ethnographic and ethnohistoric data to explore spatially and socially constructed community boundaries. An emphasis of the role that collective memory plays in defining these dynamic boundaries provides a connective framework between the material correlates and human agentic processes that reaffirm them. Importantly, this study benefits from a large, multivariate dataset that transcends the elite segment of society down through agrarian support populations, which allows our models to remain broadly informed.

Bartelink, Eric [138] see Johnson, Phillip

Barton, C. Michael (Arizona State University)

[23] *Chair*

Barton, C. Michael [23] see Bergin, Sean

Barton, Loukas (University of Pittsburgh), Robert Bettinger (University of California, Davis), Christopher Morgan (University of Nevada, Reno) and Mingjie Yi (Institute of Vertebrate Paleontology and Paleoanth)

[28] *Winter Mobility and the Microblade Adaptation in Asia and Alaska*

Though microblades first appear in northern Asia prior to the Last Glacial Maximum they aren't ubiquitous until the Younger Dryas. At the same time, human population density plummets in northern latitudes during the LGM, but stabilizes or thrives during the YD. We suggest the discordance between the archaeological signatures of similar environmental conditions be explained by the evolution of novel organizational solutions that incorporate pre-existing lithic technology rather than by innovations in the lithic technology itself. During the LGM northern latitude foragers addressed winter shortfall with a sedentary posture that restricted demographic growth whereas YD foragers addressed similar seasonal shortfalls with increased mobility, the success of which promoted growth. The lag between technological innovation and widespread behavioral change is instructive: though microblades may have emerged first for their utility in hunting, their efficiency in the manufacture of winter clothing for winter mobile foragers ushered their spread in northern Asia. We explore this proposition further by looking at the archaeological signatures of interior Alaska through the Younger Dryas.

Bartone, Dianna [100] see Oka, Rahul

Bar-Yosef, Ofer (Harvard University)

[179] *Closing the Gap between the Paleolithic and Neolithic in China*

Research and teaching in many countries of the Old World faced the same problem. Paleolithic archaeologists were interested in the early phases of human evolution from the Plio-Pleistocene to the onset of the Holocene. Neolithic archaeologists are interested in the roots of urbanism and state formation and only later look at

the origin of agriculture. Thus the transition from the Paleolithic to the Neolithic is poorly known in many regions including China. The way to close this chronological and cultural gap is to intentionally excavate and publish as many sites as possible both in the north and the south. One can hardly understand the transition from foraging to farming on the basis of a few northern sites such as the Shizitan cluster, Nanzhuangtou, Donghulin, Lijiagou or several cave sites in the south such as Yuchanyan, Xianrendong, Miaoyan, Zengpiyan and others. Cultural continuity is based on the study of lithics and pottery. Hence, the paucity of detailed publications of many well-excavated microblade sites does not allow us to fully understand the transition to the Neolithic in the north and identify the loci where people started cultivation. More studies of this period will close an important gap in our knowledge.

[66] *Discussant*

[179] *Chair*

Bar-Yosef Mayer, Daniella (Tel Aviv University)

[248] *Mud Beads in the Levant: Chronology, Distribution, Composition and Symbolism*

Beads of crumbling brown mud were discovered in a burial cave in the center of Israel, dating to the early third millennium BCE in Israel, Early Bronze Age Ib. SEM and XRF tests found the paste of which they were made to be a manganese rich siltstone, tentatively identified as Hollandite. Hollandite is not available in the vicinity of the site. Similar beads are known in Egypt from Predynastic to Middle Kingdom burials, where they were strung together to serve as the hair of dolls or female figurines made of wood. According to one interpretation the dolls were placed in burials to guarantee eternal rebirth, symbolizing the sexual aspects of regeneration.

[227] *Chair*

Basgall, Mark [12] see Delacorte, Michael

Basgall, Mark (CSU Sacramento)

[250] *Understanding the Early Milling Technologies of Western North America*

Conventional views of western North American culture history see the advent of regular ground stone use as a key technological change at the pre-Archaic/Archaic transition. Recent research in coastal and interior California suggests that full-scale milling activities appeared earlier than previously envisioned, indicating pronounced use of plant resources at or soon after the time humans arrived in the region. This paper explores variation in the composition of these first ground stone assemblages and its implications.

Bathurst, Rhonda (Western University) and Kira Westby (Western University)

[182] *Digital Tools for Archaeological Collections and Inventory Management*

What does archaeology have in common with weapons manufacturers, NASA or the automotive industry? All require a means of effectively managing and tracking inventory. There is a lot that archaeologists can borrow from the standards of practice implemented by these industries. Advances in coding and labeling systems such as 2D data matrix (DM) and radio-frequency identification (RFID) can speed up the process of data input and retrieval, alleviate transcription issues related to human error, minimize damage to artifacts, and automate collection tracking. Using DM codes to label and track individual artifacts and RFID tags to manage and track storage containers, this paper demonstrates a field-to-shelf solution for archaeological collections management utilizing some of the digital tools currently employed by major manufacturing industries.

Batum-Alpuche, Adolfo (Universidad de Oriente)

[165]

**Beyond Modern Maya Campesinos
Collaborative Archaeology: Giving the Tools of
Archaeological Interpretation to Maya
University Students.**

During the fall of 2010, I started teaching archaeology at the first state university created in Eastern Yucatan, known as Universidad de Oriente (UNO). Located in the town of Valladolid, this new university was opened by the state in order to provide intercultural education primarily to young Maya descendants from small towns throughout the region. This paper presents and discusses the triumphs and challenges of teaching Maya descendants about their own history and about the scientific tools used by archaeologists to interpret their prehispanic past. I discuss and evaluate the efficacy of being a native Maya archaeologist and a professor of archaeology.

Bauer, Jeremy (Vanderbilt University)

[171]

*In the Shadows of the Gods: Correlating E-
Groups and Households through Time and
Space*

The appearance of 'E-Group' architectural assemblages at the onset of the Middle Formative period immediately presaged the appearance of many of the social institutions equated with Maya state level society across the highlands, lowlands and Pacific coast. Indeed, the coincidental appearance of E-groups and hereditary social difference cannot be ignored. What has been ignored, however, are attempts to link the two in meaningful ways. With few exceptions, most archaeological inquiry and analysis of E-groups and their surrounding architecture focuses too heavily on cosmological meaning or solar phenomenon, rather than social phenomena. While E-group plazas and architecture connected city inhabitants with cosmic myth, solar cycles, and ritual landscapes, it also meaningfully connected them to each other, and to surrounding political entities with similar worldviews. These social connections, forged through shared cosmology, memories, and recursive daily practices, laid the backdrop for the emergence of social difference. In this milieu, households in direct proximity to the E-group, or with ancestral claims to their foundations, likely drew the most social and economic benefits. This paper will examine these contextual connections between E-groups and housemounds in the Maya area through time and space, assess the implications for social change, and suggest avenues for future inquiry.

Baumann, Steve [85] see Greene, Richard

Baustian, Kathryn (University of Nevada, Las Vegas)

[101]

*You are Who You Meet: Identity Formation in
the Mimbres Valley*

The characterization of a population as a collective entity indicates that individuals have enough commonalities to be identified as members of the same group. The identity of such a population is defined by both intragroup similarities and opposition to other groups. Interaction between groups serves to maintain and challenge social boundaries, forcing collective identity to be reshaped and renegotiated. Previous studies of interaction have addressed numerous topics such as the distribution, exchange, and the spread of ideas and technological forms across space. What has not often been discussed in detail is the role that these kinds of interactions played in the negotiation of identity. Using the prehistoric Mimbres of the American Southwest as a case study, this paper investigates the utility of exploring regional multicultural interactions to better understand identity formation of past populations. The interface between interaction and identity reveals methods by which culture change can be investigated in the archaeological record.

[101]

Chair

Bautista, Stefanie (Stanford University)

[214]

*The Reuse of Space and Place during the
Paracas-Nasca Transition: The Case of
Uchuchuma, Aja Valley, Peru*

Exploring the changes and continuities of material practices found within domestic and public spaces can help archaeologists better understand how major social transformations affected the lives of peripheral populations. This paper considers the re-use of domestic and public spaces within the context of the Paracas-Nasca transition on the Peruvian south coast. In the southern Nasca region, the transition from the Late Formative (200 B.C. - A.D. 1) to the Early Intermediate Period (EIP) (A.D. 1-700) witnesses the development of Nasca society out of the preceding Paracas culture. The nature of this Paracas-Nasca transitional period from the perspective of a domestic peripheral site remains unclear. Recent excavations at Uchuchuma, a prehispanic residential village located in the chapiyunga of the Aja Valley, Peru, have revealed evidence for the reuse of Paracas activity spaces. This paper explores recent findings from the domestic and public spaces at Uchuchuma and presents implications this research has for understanding of the Paracas-Nasca transition.

[214]

Chair

Bautista, Stefanie L. [214] see Van Gijseghem, Hendrik

Baxter, Erin

[16]

*Re-“Imaging” Aztec Ruins: An Assessment of
Great House Architecture Form and Function
through Historic Morris Photographs*

Aztec West was excavated by Earl Morris in the early 20th century. His published notes were extensive for their time, but amounted to fewer than 400 words of description per greathouse room, and even fewer for kivas. Morris, however, took over 1000 photographs, most of which have never been published. This paper will examine a few of these photographs and discuss interpretations and re-interpretations of architectural function, particularly with respect to wainscoting, pilasters and adobe masonry.

Baxter, Jane (DePaul University)

[74]

Discussant

**Baxter, Carey (USACE ERDC-CERL), George Calfas
(University of Illinois, Champaign-Urbana), Anne Dain-Owens
(US Army Corps of Engineers, ERDC-CERL), Michael
Hargrave (US Army Corps of Engineers, ERDC-CERL) and
Scott Tweddle (US Army Corps of Engineers, ERDC-CERL)**

[183]

*Detection of Historic Farmsteads in Modified
Bare Earth LiDAR Imagery*

LiDAR (light detection and ranging) data density, return classification, and surface editing are strong determinants of the potential to detect and characterize relatively small and topographically subtle archaeological and historic landscape features and impacts such as looter holes. Low density (ca. 1 point per meter) data is increasingly available at little or no cost, but standard bare earth models dramatically reduce the visibility of such features. We evaluate the extent to which archaeological and historic landscape features can be detected in low density LiDAR data by systematically comparing raster images, bare earth models, and bare earth models with selected classifications retained with site plans derived from previous National Register of Historic Places eligibility evaluations of historic sites at Fort Riley, Kansas, and elsewhere. Labor costs associated with use of modified bare earth models is more than offset by improvements in feature detection.

Bayani, Narges [157] see Thornton, Christopher

Bayham, Frank (California State University, Chico), R. Kelly Beck (University of Utah) and Kimberley L. Carpenter (Far Western Anthropological Research Group, Inc.)

[177] *Large Game Exploitation at the Boundaries: Modeling and Measuring Competition and Conflict Using Stable Isotopes*

Being a high-ranking prey item, large game are often desired for both their economic and prestige values both of which may be converted to an individual's status. As such, big game can serve as a potential axis for competition between linguistic or ethnically distinct groups particularly under conditions of population stress leading to resource depression. This dynamic has been modeled and tested in the western Great Basin (Bayham, Beck and Carpenter 2012). We here further refine the parameters of the model and explore how and under what conditions competition may lead to conflict. Implications of the model are evaluated and some preliminary tests are explored using stable isotope analysis.

Bayman, James

[255] *Culture, History, and Colonialism in the Hawaiian Islands*

Publication of the award-winning book *Anahulu: The Anthropology of History in the Kingdom of Hawai'i* by Patrick Kirch and Marshall Sahlins was a milestone in the study of the world's local and global past(s). This book illustrated and highlighted the distinctive opportunities in Hawai'i for integrating archaeological and documentary materials in the interpretation of history from the perspective of multiple voices and nested scales of analysis. The central findings of the research by Kirch and Sahlins have simultaneously enriched -- and complicated -- current investigations into the cultural, economic, and moral underpinnings of emergent colonialism in the Pacific Basin and elsewhere. Information gathered and investigated by Kirch and Sahlins underscored the dynamic cultural imperatives and individual (and collective) agencies in the political economy of "first" contact, eventual colonialism, and, perhaps ironically, the ongoing construction and perpetuation of traditional culture in the Hawaiian archipelago. This presentation outlines selected examples in Hawaii's past that exemplify this process of cultural persistence in the face of profound change. Examples are drawn from previous archaeological studies and they are focused on the material record of technological change. This paper also acknowledges the ramifications of this phenomenon for contemporary society in the Hawaiian archipelago.

[176] *Discussant*

Bazaliiskii, Vladimir [194] see Schulting, Rick

Beach, Timothy (Georgetown University), Timothy Beach (Georgetown University), Sheryl Luzzadder-Beach (George Mason University), Nicholas Brokaw (University of Puerto Rico-Río Piedras) and Stanley Walling (Community College of Philadelphia)

[213] *Wetland Field Systems at Chan Cahal, Chawak, and Ojos de Agua Northwestern Belize*

We use soil and paleoecological evidence from our 2011-2012 excavations and coring to understand ancient Maya use, formation, and chronology of perennial wetland agricultural systems at Chan Cahal, Chawak, and Ojo de Agua Northwestern Belize. The lines of soil evidence include extensive AMS dating, micromorphology, stratigraphy, magnetic susceptibility, general chemistry, carbon isotopes, and elemental analysis. The paleoecological evidence includes pollen, phytoliths, and charcoal from different sediment layers and field and canal zones of the wetlands. These lines of evidence provide a range of floodplain formation rates and show significant differences in the timing, use, and crop types of wetlands over Late Holocene. At Chan Cahal

deforestation has allowed extensive mapping and directed excavation into water management features such as dams and reservoirs. These findings suggest the extent and complexity of land management the ancient Maya invested in wetland systems and guide exploration of wetland forms and functions we find elsewhere with remote sensing imagery and analyses.

Beach, Timothy [213] see Beach, Timothy

Beasley, Melanie (University of California, San Diego)

[138] *Maritime Adaptation in Baja California: Evidence of Oceanic vs. Coastal Foraging in the Gulf of California*

This presentation examines the role of maritime adaptation and marine mammal dietary resource exploitation in Baja California. Prehistoric Southern California Channel Islands and Baja California populations have often been recognized as "The Dolphin Hunters." Much debate surrounds ideas concerning the degree of maritime knowledge and how far into the open-ocean early populations traveled to procure resources. Stable carbon and nitrogen isotope values distinguish large oceanic mammals from coastal dwelling marine mammals. This presentation will be a meta-analysis of stable isotope research of Baja California archaeological sites along the Pacific Ocean (Cape Region) and the Gulf of California (Bahia de Las Animas) to evaluate which category of marine mammals served as the primary source of dietary protein through time. Results indicate that coastal foraging species contributed more significantly to prehistoric diet in both regions. This suggests that maritime practices and hunting methods were likely used for exploiting marine mammal species inhabiting ocean waters closer to the coast rather than open-ocean.

[138] *Chair*

Beauchesne, Patrick (University of California, Berkeley)

[74] *Understanding Children in the Past through Life Course Perspectives*

Although few in number, bioarchaeological studies of ancient Romans have yielded important findings regarding the daily lives of non-elite people, knowledge of whom is often absent in other scholarly sources. This paper argues that future bioarchaeological studies have even more to offer by implementing life course perspectives, which come from many disciplines, and offer at their core a developmental and historical framework to studying the lives of individuals or groups. One of the predominant advantages of life course perspectives is that they investigate the lives of children. The study of the Roman family, and the lives of children in particular, are increasingly important in Roman studies. We argue in this paper that life course approaches provide useful and powerful new starting points to talk about how "children become children" in diverse biocultural contexts. Children have been studied extensively in past populations, but primarily through biological lenses that focus on health and pathology. Bioarchaeological voices speaking about the social lives of children have remained largely silent. In this paper we use examples from the Roman Imperial period to highlight how existing methods can be used and interpreted in new ways to make inferences on the process of childhood.

[74] *Chair*

Beaudoin, Alwynne (Royal Alberta Museum) and Gerald Oetelaar (Department of Archaeology, University of Calgary)

[131] *Landscape Recovery and Resource Availability Following the Mazama Ashfall on the Northern Great Plains*

The Mazama ashfall about 7600 years ago affected much of western North America. It was undoubtedly a significant natural

disaster for the people in the region, including those over 1000 km from the vent in southern Alberta. The Mount St Helens 1980 eruption provides comparative data to assess landscape recovery following ashfall and indicates considerable ecosystem resiliency. Monitoring shows the importance of "islands", either protected areas where ash did not accumulate or places where ashfall was thin and easily removed, as "hotspots" for reoccupation by plants and animals. Some biota were survivors, especially burrowing animals or plants with underground bulbs and rhizomes. These so-called "biological legacies" were important in landscape recovery. Other biota were colonizers using varying dispersal mechanisms. Thirty years post-eruption, landscape recovery is proceeding well, albeit with different productivity and diversity levels than before. For the archaeological past in the Mazama ashfall envelope, this suggests that habitable landscapes may have reconstituted relatively quickly, especially in areas of topographic diversity, including uplands (e.g., Cypress Hills), river valleys, and hummocky terrain. Increased patchiness in resources (e.g., berry plants) may have resulted, however. Surviving the immediate event and post-eruptive months would have been the major challenges for people in the region.

Beaudoin, Alwynne [131] see Oetelaar, Gerald

Beaule, Christine (University of Hawaii at Manoa)

[176] *Theoretical Approaches to Cross-Cultural Interaction, from Contact to Colonialism*

This presentation offers a theoretical discussion of conceptual frameworks used by historic and prehistoric archaeologists to study culture contact in many different contexts. The term culture contact itself is reformulated into a continuum ranging from short-term contact on one end to colonial occupation of a region on the other. This work draws on the scholarship of many archaeologists to offer a set of conceptual tools for grappling with, describing, and explaining some of the complexities of interaction between distinct populations who may or may not identify as ethnically different, and who may or may not belong to polities with very different levels of political power. Expanding colonial frameworks beyond historical interactions between indigenous peoples and the expanding European capitalist world economy has given archaeologists tools to recognize and describe the sometimes violent frontiers of territorial or imperial expansion in prehistory, and the ensuing political, social and material hybridization that impacts both native and foreign residents of a site or region. Thus a comparative framework is suggested to encompass a range of intercultural interaction that includes colonialism, imperialism, integration at various levels, diasporas, creolization, slavery, and exchange. It is illustrated with references to Spanish colonialism in the Americas and the Philippines.

[176] *Chair*

Becerra Valdivia, Lorena [149] see Jones, Terrah

Beck, R (University of Utah), Jack M. Broughton (University of Utah), Joan B. Coltrain (University of Utah), Dennis H. O'Rourke (University of Utah) and Alan R. Rogers (University of Utah)

[71] *Ancient DNA Analysis Confirms a Late Holocene Population Bottleneck in California Tule Elk (*Cervus elaphus nannodes*)*

Zooarchaeological analyses suggest a case of late Holocene resource depression in California tule elk (*Cervus elaphus nannodes*). We report an independent test of this that examines trends in genetic diversity derived from ancient DNA extracted from archaeological elk bone. Mitochondrial DNA sequence data from tule elk recovered from late Holocene deposits of the Emeryville Shellmound, California, indicate a dramatic decline in genetic diversity beginning about 1200 B.P. The analysis has implications for our understanding of change in human behavior

and biology during late Holocene of central California, the methodology of resource depression analyses, and the conservation biology of tule elk.

Beck, Colleen (Desert Research Institute)

[122] *An Overview of the Archaeology of Nuclear Testing at the Nevada National Security Site*
The Nevada Test Site, now named the Nevada National Security Site due to a change of mission, is located 65 miles northwest of Las Vegas and is operated by the U.S. Department of Energy National Nuclear Security Administration Nevada Site Office. This test site was the United States continental nuclear testing ground during the Cold War. Between January 20, 1951 and September 23, 1992, the United States conducted 928 nuclear tests there, 100 atmospheric and 828 underground tests. Other nuclear-related projects also were carried out within the site boundaries, an area of 1,360 square miles. The nuclear archaeology program has documented more than 650 nuclear testing associated buildings, structures, and objects, as well as artifacts related to the construction and use of testing locations. This work includes atmospheric and underground testing areas as well as the camp that housed military troops that were participants in atmospheric testing exercises. Archaeological research also has been conducted on other types of nuclear research programs, such as the Bare Reactor Experiment Nevada, an Environmental Protection Agency experimental farm, and the Nuclear Rocket Development Station. Current research is focuses on atmospheric testing remains at the northern end of the Nevada National Security Site.

[122] *Chair*

Beck, R. Kelly [177] see Bayham, Frank

Becker, Rory (EOU), Danny Walker (Office of the Wyoming State Archaeologist), Daniel Lynch (UMASS- Amherst) and Steve Haak (Independent Researcher)

[276] *Searching for a Lost Mass Grave in Wyoming*

One of the mysteries of Wyoming History is what really happened on a July day in 1865 during a battle between 20 United States soldiers lead by 11th Kansas Volunteer Cavalry Commissary Sgt. Amos Custard and 2-3000 Sioux, Cheyenne and Arapaho warriors at what has become known as the Battle of Red Buttes. Archaeological and historical research since the 1920s has failed to reveal the exact location of the Battle of Red Buttes. A reevaluation of the battle including additional archaeological field research has been ongoing since 2008 but has still failed to locate either the battle or the mass grave. Forty-five acres covering all proposed areas where the battle could have occurred were surveyed with Bartington magnetometers in 2012. Historical accounts of the battle will be reviewed followed by discussions of the 2012 survey. While a four hour battle may have an ephemeral archaeological footprint, it should still be visible because of the battle activities (i.e., burned wagon parts). Geological conditions, albeit away from reservoirs, related to drought conditions in Wyoming during the 20th century and today may be affecting the attempts to locate the battlefield.

Becker, Mark (ASM Affiliates, Inc.) and Ian Scharlotta (ASM Affiliates, Inc.)

[291] *Hunter-Gatherer Spatiotemporal Patterning in San Diego County*

A growing database of archaeological radiocarbon dates collected in and around San Diego County, California provides the opportunity to examine the efficacy of regional cultural phases based on prehistoric population histories. Current models generally hold that continuous sequential cultural phases provide explanatory structure to regional archaeological knowledge in spite of a complex physical environment spanning beaches, coastal lagoons, mountains and upland areas, and desert. Summed

probability functions and numerical modeling methods provide insight into spatiotemporal demographic patterns. Preliminary evidence suggests that phases defined primarily through lithic typologies may not reflect regional trends, but rather functional adaptations to specific environments.

Beckett, Ronald [1] see Ordoñez, María

Becks, Fanya (Stanford University)

[169] *More than Residing*

This paper will discuss the difficulties Native Californian peoples of the Bay Area have had as a result of historicized rhetoric of erasure and a lack of representation in local and state historical accounts and history writing. This rhetoric, and the difficulties Native Californian descendant communities face are based in the colonial project and have become embedded in the academic and non-academic history making of the Bay Area through the practice of archaeology. The Muwekma Ohlone Tribe of the San Francisco Bay Area, as an acknowledged but unrecognized tribe, has undertaken historical, archaeological and educational projects to work toward decolonizing their own history. In this paper I will discuss what can be done through academic archaeology to aid in the long process of decolonizing Californian history.

Beckwith, Walter

[213] *Obsidian Distribution and Diversity: A Geochemical Analysis of Obsidian Artifacts from Northwestern Belize*

The geochemical analysis of obsidian has allowed for great insights into the local and long distance interaction of Maya political economies. This paper presents data concerning one such analysis from northwestern Belize. A sample of obsidian artifacts recovered from the various contexts of the Dos Hombres to Gran Cacao (DH2GC) and related neighboring archaeological projects was analyzed using portable x-ray fluorescence spectrometry (pXRF) to quantify trace element composition and discriminate their raw material source. Artifact provenance allows for further exploration into the patterns of obsidian procurement and exchange in the region. In addition, this study highlights the potential of pXRF technology in future provenance studies throughout the Three Rivers Region.

BEDFORD, Stuart [27] see HERRSCHER, Estelle

Beekman, Christopher (University of Colorado Denver)

[133] *Built Space as Political Fields: Community vs. Lineage Strategies in the Tequila Valleys*

This paper operationalizes the Corporate and Exclusionary strategies proposed by Blanton and his colleagues (1996) by associating them with four contemporaneous social institutions in the Teuchitlán culture of pre-Columbian Jalisco with manifestations in built space. I use iconographic data to support and refine the archaeological evidence in a manner similar to Small's (2009) historical-archaeological analysis in Greece. Individually and relationally, these social institutions formed a field (Bourdieu 1990) in which different forms of capital both provided admission and constituted the objectives of competition. Once archaeological correlates for the field of power have been proposed, I consider how we might reinterpret the existing settlement pattern data for the southern Tequila valleys in the Late Formative and Early Classic. This allows me to bridge the gap between Blanton's work on political strategies and his regional settlement pattern research, and simultaneously contribute to the growing interest in the spatial aspects of authority (Smith 2003).

Beeton, Tyler [222] see Glantz, Michelle

Beier, Zachary (Syracuse University)

[261] *"All the King's Men": Labor and Diversity at the Cabrits Garrison, Dominica*

The policy of incorporating enslaved laborers into colonial military installations became standard British military policy in the eighteenth century. The Cabrits Garrison, Dominica, occupied by the British military between 1763 and 1854, was built entirely by enslaved labor and staffed with Afro-Caribbean soldiers following the introduction of the West India Regiments in 1795. Using available archival and archaeological evidence from structures occupied by the British military, including enslaved laborers and soldiers of African descent, this paper compares eighteenth- and nineteenth-century residential quarters to provide a vantage point exploring symmetries and asymmetries between structural principles and agent-centered practice. I examine this setting for its connection to developments in the British military complex, as well as the integration of Caribbean plantation culture and politics into the structure of daily life at the Cabrits Garrison. I employ intra-site comparisons and analytical approaches to reconstruct occupational histories and better understand social interactions as well as the manner in which changes in the labor regime effected identity formation. Approaching British fortifications in this manner contributes to black Atlantic military history—a lens that works to embody the diversity of these military communities and the tangible and intangible products of their labor.

[261] *Discussant*

[261] *Chair*

Belardi, Juan Bautista [26] see Barrientos, Gustavo

Belardi, Juan (Univ Nac de la Patagonia Austral), Gisela Cassiodoro (CONICET-INAPL), Rafael Goñi (INAPL-UBA-UNCPBA), Michael Glascock (University of Missouri) and Alejandro Súnico (Universidad Nacional de la Patagonia Austral)

[148] *Limolites from Southern Patagonia (Argentina): Their Source and Archaeological Artifact Distributions*

One important aspect to be known on hunter gatherer Patagonian archaeology is their mobility and interaction spheres, mainly along the Late Holocene. One way to approach this is tracing the distribution of lithic archaeological materials. Artifacts made on limolite (a sedimentological silicified rock) are found on the western strip of southern Patagonia. On the base of the high density of archaeological material and geomorphological studies the source and quarries of limolite were identified in the lake Cardiel. The geochemical study of samples from both the source and archaeological sites from several neighbor basins allowed to trace the use of this rock and to model its circulation. There is geochemical intrasource variability but it seems not be related to their fracture and quality properties. The archaeological spatial distribution indicates that limolite circulation has a southern vector and was incorporated from the beginning of the human occupations. From a geographical standing this is a marked difference when one compares to the distribution of the Pampa del Asador obsidian which shows a broader circulation pattern. This could be related to the greater availability of high quality rocks (obsidian and chert) northwards of the limolite source

Belcher, William [190] see Ikebara-Quebral, Rona

Belfer-Cohen, Anna [248] see Shaham, Dana

Bell, Alison (Washington and Lee University)

[44] *Constituting Personhood among "The Middling" in 18th- and 19th-Century Virginia*

Historical archaeologies of many periods and places tend to illuminate experiences of outliers – the wealthy, influential, and

urban on the one hand, the deeply socially disenfranchised or otherwise "exotic" on the other – more fully than those of the demographic middle. As we frequently know less about the material lives, experiences, and aspirations of the broad socio-economic center, this paper investigates "middling" people in rural Virginia during the 18th and 19th centuries. Archival, oral historical, and archaeological research on tenant farmers and farm managers/overseers raises a number of questions, including fundamental ones about their construction of personhood. Despite efforts to accommodate their actions to models of conspicuous display that convincingly fit their more (and often less) affluent contemporaries, there is little indication that the middling regularly conceptualized persons as individuals striving to exhibit hidden qualities through the consumption of costly material culture. To understand their constructions of personhood, this paper follows the "ethnographic"/ archaeological lead of information left by two tenant farmers and one farm manager in Virginia (c. 1775-1825), and posits that relationships among things and people – nexuses of labor, kin, livestock, and land – rather than ambitious individualism were constitutive of "the person."

Bell, Ellen (California State University, Stanislaus)

- [57] *Layers of Meaning: Multi-Level Caches and Offerings at Copan, Honduras*

While the tombs that held the remains of the kings of the Classic period (A.D. 425-825) Maya center of Copan, Honduras, have garnered copious attention, they are but one element of a multi-faceted program of ritual activity that defined sacred space at the center. This paper explores the use of multi-level, "cosmological" offerings to structure royal space within the Early Classic levels of the Copan Acropolis and to underwrite strategies of political legitimization. By recapitulating layered cosmology and locating the ruler at its center, these placed deposits work to align the social and political hierarchy with culturally constructed visions of the natural order, thus reinforcing claims to power that are, at times, not particularly well founded. This analysis brings to the forefront elements of ritual practice that, taken together with royal interments and other highly visible elements of the built environment, provide a deeper and more nuanced understanding of materialized political discourses than has been achieved previously.

Bell, Colleen (University of Tulsa), Miriam Belmaker (University of Tulsa) and Donald Henry (University of Tulsa)

- [253] *Comparison between 3D Geometric Morphometric Analysis over Traditional Linear Methods in Lithic Assemblages; Tor Faraj, Jordan, a Middle Paleolithic Site as a Case Study*

Characterization of lithics is at the core of understanding early human behavior. Accurate and repeatable measurements are vital for our ability to cross compare assemblages synchronically and diachronically. Today, these measurements are obtained through calipers. Recently, the use of 3D geometric morphometrics has revolutionized paleoanthropological studies, but this has not transitioned to lithic analysis. The potential for increased accuracy and the ability to gather new information has been suggested (Crompton, 2007) but merits additional research. This study will compare these two methods using the Middle Paleolithic site Tor Faraj, Jordan as a case study. The lithic assemblage from this collection has well known provenience and good taphonomic control. These advantages make the collection ideal for a methodological comparison. Results indicate that 3D geometric morphometrics produces results with less inter and intra observers' variability with reduced margin of error over the digital calipers for all variables measured. Furthermore, the use of GM allowed us to test for several additional variables that we cannot test with linear measurements alone. Therefore, we conclude that the application of GM has great potential and 3D scanning has an application for answering several of the outstanding questions regarding characterization of lithic assemblages.

Bellantoni, Nicholas

- [260] *Bioarchaeological Recovery of Four Catholic Burials, New Haven, Connecticut*

In July of 2011, the CT State Archaeologist was notified by the New Haven Police Department that skeletal remains had been uncovered during construction activities at Yale-New Haven Hospital. Rescue excavations of four individuals were undertaken. In 1834, the hospital site was the location of the Christ's Church, the first Roman Catholic church and its associated burying ground. By the 20th century, the cemetery was lost and forgotten in city's cultural memory. Christ's Church cared for Irish immigrants and the poor. Three of the four burials were stacked into the same grave shaft. This paper presents the discovery, archaeological removal, and community involvement of the project.

- [260] *Discussant*

- [260] *Chair*

Bello, Silvia [98] see Evans, Adrian

Bello, Charles (Federal Emergency Management Agency (FEMA-DHS)), Alvin J. Windy Boy, Sr. (THPO - Chippewa Cree Tribe, Rocky Boys Reservation), Robert C. O'Boyle (Archaeologist - Chippewa Cree Tribe, Rocky Boys Re) and Duncan Standing Rock (Chippewa Cree Cultural Resource Preservation Department)

- [262] *Tribal / Federal Partnership – Chippewa Cree Tribe and the Federal Emergency Management Agency (FEMA): Two Case Studies of Effective Hazard Mitigation and Cultural Resource Management on the Rocky Boy Reservation, Montana*

The impact of natural disasters on cultural resources is well-known in Western U.S. Indian Country. Tribes are often challenged in the ability to address such concerns. This paper addresses measures funded by FEMA through the Hazard Mitigation Grant Program in partnership with the Chippewa Cree Tribal Council and the Historic Preservation Office (THPO). Two projects are presented, both identified in the Tribe's Multi-Hazard Mitigation Plan.

The first repairs damage / stabilizes Crier's Rock, a traditional cultural property that is deteriorating from repeat flooding. Geotechnical analysis and (green) engineering practices sympathetic to the importance of the site are employed, resulting from THPO input / conditions, guidance from elders, and cooperation from the BIA and Montana SHPO.

The second is an educational awareness project where funding mitigates against the loss of Chippewa Cree history and culture by training anyone who works on the Reservation. The project is overseen by THPO staff and combines a variety of innovative methods (weighted on traditional knowledge and Federal compliance). This project speaks directly to the Mission Statement of the Tribe's Cultural Resource Preservation Dept. – "To maintain and inspire traditional values relating to the Ojibwa and Ne-hi-yah-w through established principles: Culture, History, Language and Life."

- [262] *Chair*

Bellorado, Benjamin A. [51] see Hurst, Winston

Bellorado, Benjamin (University of Arizona), Laurie Webster (University of Arizona) and Thomas Windes (University of New Mexico)

- [139] *Footsteps of Identity: The Context of Pueblo III Sandal Imagery in the Northern Southwest*

In the wake of the Chaco Regional System with its pilgrimages and road systems, walking and moving appear to have been of particular importance in ancestral Pueblo society. The technology

of walking across the landscape, namely with sandals, evidently held special meaning for ancestral Puebloan peoples as did leaving one's mark on the land through depictions of sandals or sandal tracks. Rock art distributions, incised and painted wall murals, tree-ring dating of intact kiva roofs, and almost-forgotten museum collections from southeastern Utah suggest that a tradition of rock art and kiva murals depicting sandals or sandal tracks was pervasive in the area between A.D. 1200 and 1250. These sandal images provide an immobile record of an otherwise highly mobile and perishable technology, which, by its very nature, walked away from its place of manufacture. Many of these sandal images exhibit a common vernacular of distinct design layouts and construction techniques that likely signaled individual and group identity and possibly ethnicity within and between communities of practice. This presentation discusses the dating and context of Pueblo III sandal imagery in the Comb Ridge and Cedar Mesa areas of southeastern Utah and offers ideas about the significance of this figurative art tradition.

Bellot-Gurlet, Ludovic (Université Pierre-et-Marie-Curie), Laurence Manolakakis (CNRS, Lab. Trajectoires), Martine Regert (CNRS, Lab. Cepam) and Céline Paris (CNRS, Lab. Ladir)

[39] *From Materials to Symbolic Function: Pigments and Glue Residues in a Neolithic Funerary Context*

Two grave pits in a Neolithic burial monument from Northern France, dating to 4200 BC, produced numerous finds and in particular 16 projectile points. A black, amorphous matter was observed on several of these flint points and, more exceptionally, one showed a blue-grey line on its axis. This projectile point is too large and heavy to be a functional arrowhead. Before examining the significance of these finds in their funerary context, the two types of residue had to be identified. An analytical strategy was thus developed to characterize the mineral substances in the blue residue, as well as the organic materials making up the black aggregates sticking to the arrowheads, using a combination of structural and separating methods (infrared and Raman spectroscopies, mass spectrometry, gas chromatography). The burial within a monument, the abundance of projectiles, in particular in one of the graves, its elaborate construction, together with the adhesive materials and coloring associated with lithic arrowheads, are all criteria that indicate a particular status for the deceased, whose weapons could be those of a great warrior or great hunter.

Belmaker, Miriam [162] see Clardy, Kelsey

Beltrán, Boris [21] see Rivera Castillo, Patricia

Beltrán Medina, José Carlos (Centro INAH Nayarit)

[107] *Mololoa, un entierro en la montaña*

Este escrito tiene por propósito la descripción de las características principales de un entierro colectivo encontrado en las faldas del cerro de la Batea, ubicado en las afueras de la ciudad de Tepic. El entierro está formado por 11 individuos que fueron cremados y depositados en 2 urnas cilíndricas antropomorfas y en 10 ollas, tratándose de un rito fúnebre complejo de dobles exequias, donde están presentes varios procesos como la preparación de los cuerpos, la cremación, el acomodo de las cenizas y de los restos humanos en el interior de las urnas, y el entierro del conjunto ya en su ubicación final. Para poder cumplir con nuestro propósito es presentada la disposición que mostraban los diferentes elementos arqueológicos entre sí, al momento de su hallazgo, así como los diversos materiales arqueológicos procedentes de este entierro, compuesto por un altar lítico que constituye la parte central del conjunto, lo mismo que por 17 figurillas sólidas antropomorfas y 2 figurillas zoomorfas, lo mismo que por una raedera y una navajilla de obsidiana verde, las cuales constituyen la ofrenda principal junto

con las vasijas, ollas y urnas funerarias.

Bement, Leland (Oklahoma Archeological Survey, OU)

[276] *The Effects of Multi-Year Droughts on Cultural Resources: Headaches and Research Potentials*

Severe multi-year drought in Oklahoma has lowered reservoir levels, exposing cultural resources including human burials. This drought has also dried vegetation, providing fuel for extensive grass fires that destabilize the landscape and promote erosion that also increases cultural resource exposure and destruction. Two examples of drought-induced cultural resource management actions are presented and discussed in terms of decision making and problem solving for property managers and the research potential this situation provides.

[116] *Chair*

Bement, Leland [116] see Carlson, Kristen

Benally-Littletree, Yolanda (Navajo Mine)

[152] *Collaborative Archaeology and Private Industry: Moving Beyond Section 106*

To fulfill the Section 106 consultation with the Navajo Tribe's Historic Preservation Officer, there was an agreement to put together a popular summary about the area that was scheduled to be impacted by mining in the near future. The popular summary was a collaborative effort with guidance from the THPO to write from a Native perspective as opposed to traditionally "western" archaeological perspective. The stories would come from oral traditions passed on from the people within the community and the tribe which would be brought together to explain why people came together to this one area. The popular summary not only presented what artifacts were found, but also what clans lived in the area and where they originated from. The summary included many colorful stories and old photos that showed progress since the 1950s. The focus was on the history of the people from the area, not on mining.

Bender, Shilo (University of Missouri), Jeffrey Ferguson (University of Missouri) and Scott VanKeuren (University of Vermont)

[267] *Rapid Qualitative Compositional Analysis of Ceramic Paints: A Study of Fourmile Polychrome*

Portable X-Ray Florescence (pXRF) is a valuable analytical technique for rapid compositional analysis. Ceramic paints and other surface features pose a particular problem for XRF due to the inability to control for varying paint thickness and the contribution of underlying slip and paste. In this study of mineral paints in fourteenth-century red ware from east-central Arizona, we developed a protocol for the rapid in-field qualitative analysis of the paint composition. The study yielded differences in the paints between typical Fourmile-style bowls and contemporary copies, which corroborates the results of a recent compositional study of sherd samples that used inductively coupled plasma-mass spectrometry.

Bennett, Gwen (McGill University, Depts. of Anthropology & EAS)

[24] *Borders on the Land, Borders in the Mind: The Archaeology of the Khitan/Liao Period in North China*

The Khitans ranged around China's Great Wall region and across Mongolia, established the Liao Empire in 907, and controlled a continental scale realm until they were conquered in 1125. Chinese records, rich tombs, pagodas, and walled cities across the northern landscape provide material documentation of elite life, but we know little about the larger society that sustained that archaeologically and historically visible life, or about the complex

socio-economic-political web the Khitans emerged from. Chinese records described the Khitans as nomads, and almost all subsequent historical and archaeological work has been predicated on this assumption. But insistence on the nomadic nature of the Khitans has much to do with the researchers who studied them, and whose self-identification as ethnic Han elite instilled the idea that non-agrarian life was "uncivilized." Until recently, archaeological work in China has maintained this conceptual boundary, by its insistence on mapping out bounded homogeneous cultural units, focusing on elite-oriented sites, and studying different classes of artifacts in isolation. This paper presents work on Chifeng, Inner Mongolia that is overcoming the conceptual boundary imposed on the Khitan/Liao by incorporating history, archaeology, and new theoretical insights on boundaries and frontiers, and the contingent nature of identity and social groups.

Benson, Alexa and Rainer Grun (Professor in the Dept of Archaeology and Anthropology)

[11]

Laser Ablation Depth Profiling of U-series and Sr Isotopes in Human Fossils

In recent years we have focused on using laser ablation ICP-MS for the analysis of U-series isotopes for the dating of human remains and Sr isotopes for the reconstruction of human migrations. Thus far, the isotopic measurements necessitated the cutting of bones and teeth to obtain data from flat cross sections. While the cutting itself only consumes a small amount of material (the width of the cutting blade is less than 100 µm), this slightly destructive approach is still not fully appreciated by the custodians of valuable human fossils. This is of particular importance in Australia, where all fossil human remains are sacred. We have started to use laser ablation surface profiling for the rapid assessment of whether human bones or teeth are suitable for subsequent dating. This is now further investigated to full depth profiling. While there are considerable analytical problems associated with this method it has the promise that the cutting can be completely avoided and all isotopic data can be extracted from a single hole with a 300 to 400 µm diameter.

Benson, Lisa (University of Utah and SWCA) and Katie Saunders (University of Utah and Natural History Museum of U)

[41]

A Look at Osteological Stressors during the Fremont Period in Utah

Many projects throughout various parts of the world have reported several different osteological effects as a result of agricultural based diets. We would like to see if there is a correlation between stress markers in the biological record and the current data we have about agriculture in the Fremont Period in Utah. This study will be conducted at the Natural History Museum of Utah, Salt Lake City, and will compare the Fremont with the Anasazi sample to determine if the lower return rates of an agricultural diet had an apparent negative effect on the osteological record. Three skeletal stress markers will be analyzed: enamel hypoplasia, periostitis lesions (in the tibia), and cribria orbitalia. We hope to see a correlation between the archaeological and osteological data.

Benson, Lisa [148] see Pollock, Jacob

Berard, Benoit (Université des Antilles et de la Guyane-EA 929)

[292]

Why We Are Our Fathers: Amerindian Heritages Social Integration Process in the French West Indies

Amerindian Kalinago peoples are very rare in Fort-de-France or Pointe-à-Pitre streets nowadays. Due to the dramatic aspects of colonial contact and colonization, Amerindian genetic heritage is now very low in the French Antilles in comparisons with African, Asian and European ones. However, Guadeloupe, and more so

Martinique, have been pioneer places and central actors in pre-Columbian archaeology in the West Indies. Amerindian legacies, near invisible for centuries, in the past two decades have a real place in this territory's cultural landscape. In this presentation we will analyze the historical steps of Amerindian legacies' integration in French West Indies heritage and identify creole constitutive elements. In this way, we will try to identify and analyze the social and cultural mechanisms associated with this process and link them to the self-identity building process in the French Caribbean.

Berdan, Frances (California State University San Bernardino)

[133]

Commodity Complexes in the Late Postclassic Mesoamerican World System

This paper takes a "product-based approach" to world systems, using as its model the "goods-based approach" to world systems formulated by Richard Blanton and his colleagues in 2005. In this approach they analyzed the economic dimensions, dynamics, and contexts of five important commodities: obsidian, salt, cacao, cotton cloth, and pottery. Much as Blanton and his colleagues selected a small sample for their study, I limit my discussion to two types of products: feathered adornments and turquoise mosaics. Both were luxuries, and both were economically and socially complex. These objects had complicated production histories: their manufacture depended on the acquisition of a wide range of raw materials from varied ecological regions, the use of a wide variety of tools, and the application of highly specialized knowledge and techniques. The manufacture of any of these objects required that these materials and human skills converge at the same time and place. A primary goal of this paper is to illustrate how this was achieved, and to demonstrate how unraveling the life histories of these production systems can provide clues to the integration and dynamics of the Late Postclassic Mesoamerican World System.

[229]

Discussant

Berg, Greg [251] see Congram, Derek

Bergin, Sean (School of Human Evolution and Social Change, ASU) and C. Michael Barton (Arizona State University)

[23]

Dimensions of Human Land-Use Practices: An Exploration of Socio-Natural Interactions in Neolithic Spain.

The term "agropastoral" encompasses a wide diversity of human domestic subsistence systems and social arrangements--and a corresponding diversity of ways in which associated land-use impacts the natural world. We use computational modeling to systematically explore the range of land-use practices in Neolithic-level agropastoral communities and their consequences for Mediterranean landscapes and village life.

The MedLands Modeling Laboratory (MML) couples an agent-based model of small-scale agropastoralists with models of landscape evolution to enable controlled study of socio-natural interactions. In the MML, agropastoralists make subsistence decisions at a household-level based upon past returns, household needs, ownership constraints, and conditions in the surrounding environment. These decisions drive land-use practices that can reshape the landscape through the interactions with natural processes like climate, vegetation growth, erosion, and soil fertility.

Here we evaluate human impacts to the environment in the Penaguila valley of eastern Spain across a range of Neolithic land-use practices spanning plant cultivation to pastoralism, and assess the recursive consequences of anthropogenic landscape change on Neolithic communities. The MML provides a modeling environment in which to compare the sustainability of different combinations of farming and herding, and their role in transforming Mediterranean landscapes into the configurations that characterize the region today.

Berkebile, Jean (University of Cincinnati)

[69] *Investigating Subsistence Diversity in the Upper Basin: New Archaeobotanical Analysis at MU 125*

The unique topography of the Upper Basin, on the southern rim of the Grand Canyon, makes it a transitional environment that acts as a cultural and environmental frontier. The pinyon-juniper woodland environment of the Upper Basin hosts a diversity of wild resources that provided opportunities for a variety of subsistence strategies. While the dominant paradigm interprets the Anasazi as strict maize agriculturalists, archaeobotanical evidence from Site 17, a multi-room masonry structure, has been interpreted as evidence for a mixed subsistence economy based on a macrobotanical assemblage that yielded 99.5% wild remains and 0.5% domesticated remains. This evidence suggests a more heterogeneous pattern of subsistence adaptations among Late Pueblo II (A.D. 1050-1100) Kayenta Anasazi populations than previously considered. To explore this question, I conducted archaeobotanical analysis on site MU 125, a six-room masonry structure occupied from A.D. 1070-1090, which is not only contemporary with and typologically analogous to Site 17, but is also situated in the same type of Upper Sonoran environment. Preliminary analysis of wild plant ubiquity, abundance, and seasonality of MU 125 adds to our understanding of Ancient Puebloan subsistence practices and resource activity scheduling.

Berman, Mary Jane (Center for American and World Cultures)

[254] *Discussant*

Berna, Francesco [290] see Thibodeau, Megan

Bernardini, Wesley (University of Redlands)

[67] *Visual Prominence and the Stability of Cultural Landscapes*

This paper presents an analysis of landscapes and prominent landforms in the American Southwest. Guided by insights from Hopi traditional knowledge, a massive GIS analysis is employed to quantify the stability of regional cultural landscapes over time. The analysis highlights the exceptional continuity of the Hopi cultural landscape and the role played by landforms whose visual prominence helped to anchor religious practice, collective memory, and group identity.

Beron, Monica

[20] *Engagement between Prehispanic Hunter-Gatherers and Dogs from Western Pampa, Argentina: Diet and Mortuary Practices*

Among the various links between man and dogs, one of the most intimate is that involving its presence in mortuary contexts, a fact documented in various parts of the world. Recently, a double burial of a subadult human male in close association with a specimen of *Canis familiaris* has been recorded at the site Chenque I (Lihué Calel, province of La Pampa, Argentina). The radiocarbon date obtained (930 ± 30 years BP) clearly points the presence of domesticated dogs in prehispanic times in this area of the southern cone of America. Otherwise, the stable isotopes analyses of dog remains indicate a diet similar to those of human's tendencies in the area. The dog shows an injury in right scapula, partially healed prior to death and a severe wear of the dentition. Also, this burial is heavily ritualized burial because the child has an important ajuar and is carefully placed in intimate relationship with the dog, to the point that the animal's limbs were placed over the child's body. These data suggests a situation of pet treatment and special care of this animal.

Berquist, Stephen

[200]

Terraces all the Way Down: Ideology and Ontology in an Andean Agricultural Landscape

One of the most visually striking aspects of the Andean landscape is the extensive terracing of the mountain slopes. Although such terraces, known as andenes, are agriculturally efficacious, it has been noted repeatedly that the scale of these modifications to the landscape, especially in the Inka heartland, is beyond what might be expected solely in the context of agricultural production. This paper will present original research on the physical characteristics of such terraces as might be relevant to agriculture, as well as on the location of terrace complexes in relation to contemporaneous archaeological remains. Drawing on previously published research regarding andenes this paper will examine how terraces were deployed as an ideological tool by the expanding Inka State. Moreover, the ubiquity of terraces and the centrality of agricultural praxis to the Inka state prompt the leveraging of andenes as an analytical device, to investigate how the implications of this state mobilization of the landscape may broaden our understanding of indigenous Andean ontologies. To accomplish this goal, this paper will mobilize the work of social theorists such as Barthes, Heidegger, and Deleuze in order to set the andenes within a broader network of being and becoming.

Berry, Michael [106] see Kohler, Tim

Bertulli, Margaret [221] see Dawson, Peter

Bestel, Sheahan and Tianlong Jiao (Bishop Museum, Hawaii)

[66] *Archaeobotany of Proto-Austronesian Sites*

An archaeobotanical analysis of proto-Austronesian sites located on the Fujian coast of south China was undertaken. Flotation samples from the shell midden site of Damaoshan were collected and sorted and plant residue analysis from pottery at the same site was undertaken. Other sites in Fujian Province, including the Tanshishan site, were also sampled for evidence of plant foods that may hint at the identity of the proto-Austronesian people.

Bethke, Brandi (University of Arizona)

[278] *A Networked Landscape: Understanding Meaningful Places along the Niobrara/Missouri National Scenic Riverways (NIMI)*

The Niobrara/Missouri National Scenic Riverways (NIMI) straddles the South Dakota-Nebraska border on the eastern reaches of the Great Plains. The NIMI is a culturally rich and historically diverse area that has experienced a fluid movement of past and present native groups in, out, and within its boundaries. This paper combines archaeological, historic, and ethnographic evidence of land utilization, focusing particularly on the similarities and differences of experience of the Ponca, Omaha, Yankton and Santee Sioux tribes, each of whom have in the past and continued to maintain unique cultural ties to the riverways. The study focuses on bonds between the natural, cultural, social, and spiritual worlds, and how these relate to the physical landscape. Data from within and outside the park boundaries is used to better understand the park's place in these regional cultural histories. The broader regional landscape focus facilitates an exploration of connections between sites, significant places, and landmarks in and outside of the parks that were potentially used by the same groups of people and their descendants. A discussion of methods for conducting cultural landscape surveys through collaborative research among NPS, university researchers, and native groups helps to better understand diverse conceptions of NIMI's land and resources.

[278] *Chair*

Bettencourt, Nichole [62] see Goodman-Elgar, Melissa

Bettencourt, Nichole (Washington State University)

- [224] Techniques for South American Mudbrick Analysis**
 Mudbricks are one of the oldest and most commonly employed building materials in the world due to their stability, durability, and ease of manufacture. The amount of labor invested in the manufacture and construction of mudbrick architecture has a direct correlation with the scale of a site and the complexity of social interactions between its members. Very little work has been done in South America using geoarchaeological methods to study mudbricks, and proposed lines of research for the methods discussed in this paper include geochemical sourcing of mudbricks and the analysis of structural properties at various stages of building construction, use, and abandonment. Simple visual macro-analysis can make general distinctions between temper and mudbrick compositions, with more nuanced comparisons provided by thin section analysis. Additionally, elemental composition analyses may be able to distinguish between potential source communities by differences in mineral compositions of the sediments used. Furthermore, little research has been done on the effect of firing temperatures on the structure and coloration of mudbricks. By utilizing four geoarchaeological methods (thin section analysis, XRF analysis, and the measurement of color and apparent porosity) research in mudbrick sourcing and structural properties can be expanded past work currently done in South America.

Bettinger, Robert (University of California-Davis)

- [66] Hunter-Gather Mobility and the Development of Millet Agriculture in North-Central China**
 That the origins of millet agriculture in North China remain nearly as enigmatic as they were 20 years ago despite substantial recent research suggests a problem having more to do with the kind of hunter-gatherer groups that first experimented with millet production, and the reasons for those experiments, than poor site preservation or researcher indifference. Mobility is almost certainly the heart of the problem. Three sites in north-central China (Pigeon Mountain, Shuidonggou 12, and Dadiwan) demonstrate that in its westernmost Laoguantai center, early millet agriculture developed out of an intensive hunting adaptation strongly dependent on winter mobility that generated a vanishingly thin archaeological record. Microblade technology was key to this adaptation, mainly in connection with microblade use as insets in composite knives needed for production of sophisticated cold weather clothing needed for the kind of winter mobile hunting Binford termed "serial specialist." Limited time and opportunities compressed this production into a very narrow seasonal window, putting a premium on highly streamlined routines where microblade technology excels. Fast-growing millet, which could be planted and harvested to fill a resource void, as well as feed dogs needed for hunting and transport, was especially well-suited to this wide-ranging, highly mobile system.

[12] Discussant

[12] Chair

Bettinger, Robert [28] see Barton, Loukas

- Bevan, Andrew (University College London) and Andrew Bevan (University College London)**
[23] Joint Evolutionary Models of Places, Paths, and Landscapes

Comparative, longitudinal analysis of human settlement is one of the areas where archaeology is well-placed to contribute to wider debates in social science, with particular attention to demographic flows, economic transactions and/or other social interactions among neighboring settlements. This paper explores some computational and spatial modeling approaches to the coupled evolution of settlement hierarchies, route systems, and anthropogenic landscapes. It builds on a series of methods drawn from point process modeling and urban geography, but ultimately

suggests a combined approach that is tailored to the uncertainties presented by archaeological evidence. A case study using Mediterranean datasets is offered as an example of the benefits of this kind of model-based inquiry.

Bevan, Andrew [23] see Bevan, Andrew

Bey, George (Millsaps College) and Rossana May Ciau (INAH, CRY)

- [171] The Preclassic and the Rise of Social Complexity in the Bolonchen District of Yucatan**
 The southern Puuc region of Yucatan, known as the Bolonchen District, was occupied early in the history of the northern Maya. Unlike the northern Puuc where huge centers developed in the Middle Preclassic, sites remained small throughout the Preclassic in the south. Archaeology in the region reveals variation in site layout and history with some sites abandoned in the Preclassic and other occupations continuing into the Classic Period. Using data from over a decade of research at Kiuic and other sites studied in the Bolonchen Regional Archaeological Project, this paper looks at the initial occupation and development of communities in this harsh environmental zone as well as relationships between the region and the rest of the Puuc and larger northern Maya lowlands. Sites such as Kiuic were already part of a larger Maya world in the early Middle Preclassic and evidence for ceramic exchange using ICP-MS data suggests both local and long-distance exchange in the Middle Preclassic. Recent data is leading to a reevaluation of the scale of monumental architecture at Kiuic and the nature of residential occupation.

Bey III, George [65] see Parker, Evan

Bezerra, Marcia (UFPA/IPHAN)

- [60] Connecting Dots: The Construction of "Amazonian Archaeology" in the Curricula of Graduate and Undergraduate Courses In Amazon**

Over the past decades, Amazonian Archaeology has been changing dramatically as new interpretations about local contexts are provided. The theoretical parameters for understanding the archaeological record in Amazon have led to an interesting and refreshing panorama of the past that reveals a meaningful diversity of cultural practices and, at the same time, points to data and phenomena that share strong similarities, even in distinct contexts in the region. Nevertheless, the possibility of "connecting dots" along Amazonian, does not legitimize a concept as "Amazonian Archaeology." In this paper I briefly discuss this concept as an analytical category for understanding the construction of knowledge concerning archaeology as it is presented to the new generation of archaeologists trained by five universities located in different states in Amazon.

[118] Discussant

Bhak, Jong [22] see Bhak, Jong

- Bhak, Jong (Genome Foundation), Jong Bhak (Personal Genomics Institute, Genome Research Found), YoungAh Shin (Personal Genomics Institute, Genome Research Found), Sanghoon Song (Personal Genomics Institute, Genome Research Found) and PASNP Consortium (PASNP consortium)**

[22] Single Route Asian Migration and Koreans by Genetic Markers

Genomes contain the most definite information on the evolutionary history of humans. Genome sequencing technologies enable us to investigate the hidden genetic history of modern humans. The

discovery of new markers for identifying ethnic and individual expressions of traits is essential in genetics-based archaeology. We present a Pan-Asian study of human migration using DNA chips and discuss the future genome technology to refine the genetic diversity and migration of Asian ethnic groups, especially East Asians.

Bhan, K. [147] see Costa, August

Bhiry, Najat [137] see Steelandt, Stéphanie

Bianco, Briana

[234] *Beekeeping Practices in Modern and Ancient Yucatán: Going from the Known to the Unknown*

According to historic documents and scarce archaeological data, apiculture with the stingless bee, *Melipona beecheii*, was significant in the diet, economy, tribute, medicine, and ritual practices of pre-Columbian Mesoamerica. Beekeeping practices have changed as a result of the introduction of other species of bees, as well as taxation and intensification of honey and wax production under the Spanish colonial regime. Today, the global economy has linked Yucatan's beekeeping cooperatives with the rest of the world. Current meliponiculture gives us a frame of reference for interpreting the archaeological record. This poster focuses on ethnoarchaeological studies carried out in Yucatán, Mexico. Soil samples collected from underneath and near beehives, as well as samples of honey and wax, were analyzed using Fourier Transform Infrared Spectroscopy in order to identify possible chemical signatures for soil near apiaries. The soil was also tested for pH and nitrate differences with the goal of developing new methods to identify apiaries in the archaeological record. Ethnoarchaeological and soil chemical studies inform conservation efforts aimed to prevent the disappearance of traditional beekeeping practices, the disappearance of the variety of plants necessary to produce honey, and the disappearance of stingless bees themselves.

Bickham, Maureen (University of Missouri St. Louis)

[6] *Marine Shell Exchange among Mississippian People of the Southeastern United States*

The Mississippian Period (AD 1000-1400) of the Midwestern and Southeastern United States is well recognized for its extensive networks of long-distance trade, through which exotic items and associated iconography and ideologies were shared among sites. Marine shell was one such item that has been recovered from numerous Mississippian sites, where it was often crafted into beads, incised gorgets, and other symbolically and ritually important products, yet specific networks of shell exchange are not well understood. Using a GIS analysis, marine gastropod habitats are compared with excavated shell artifacts in archaeological assemblages from Cahokia, Etowah, Moundville, and Spiro. The comparative assessment of material from multiple sites is useful to help identify possible networks of exchange, providing a better understanding of Mississippian interaction.

Bickler, Simon [27] see Mulrooney, Mara

Biehl, Peter (SUNY Buffalo)

[52] *Discussant*
[221] *Chair*

Biella, Jan

[53] *Discussant*

Bies, Michael

[18] *Rolling Rock*

Several images within the Dinwoody Tradition have been identified as actors or characters in the legends of the Shoshone and Gosiute. This paper will present an additional identification for consideration.

Biggs, Jack (Texas A&M University)

[39] *Mortuary Correlates of Maya Cranial Shaping in the Pasión Region*

In the Pasión region of the Southern Lowlands of Guatemala, the ancient Maya practiced various types of intentional cranial shaping. This permanent body modification was employed by different techniques in order to accomplish certain and desired shapes. Using cranial data gathered from the sites within the Pasión region (such as Tamarindito, Dos Pilas, Aguateca, Altar de Sacrificios, and Seibal) along with the corresponding mortuary data, this paper will draw correlations between the specific types of cranial shaping and social status in ancient Maya society. Although most of the cranial shaping conforms to the tabular oblique variety, key burials in unusual mortuary contexts show distinct shapes that may be informative of social position within the sphere of the ancient Maya world.

Bignon, Olivier [227] see Peschaux, Caroline

Biittner, Katie (University of Alberta)

[8] *Footprints and Black Stones: Documenting Cultural Heritage Sites in Iringa*

Working closely with local communities has facilitated the documentation of a number of interesting cultural heritage sites in Iringa Region, Tanzania. Two of these sites are described by locals as containing "footprints" similar to those found at Laetoli in northern Tanzania. Analysis of these footprints indicated that they are "just" natural impressions in the rock. Although not of archaeological or paleoanthropological significance, these two "footprint" sites are an important part of the local cultural landscape. A discussion of a third site, that of the "Black Stones of Ruaha River", will further illustrate the importance of documenting landscape features as key components of the heritage and history of a region.

Bikoulis, Peter (University of Toronto)

[240] *Adapting Geographical Information Science Techniques to Study Settlement Logic: An Experiment in Site Exploitation Territory Analysis*

This paper presents the results of exploitation territory analysis, commonly known as "site catchment analysis," investigating agricultural productivity potential of selected prehistoric sites using Normalized Difference Vegetation Indices (NDVI) derived from archived MODIS satellite imagery. Exploitation territories surrounding sites used in this case study are generated using the open source GIS known as GRASS. The NDVI is typically used within geography as a measure of vegetation productivity, but has been adapted here to archaeological purposes through the creation of a composite image based on long-term climate data and historical census and agricultural statistics. As an experimental simulation of prehistoric environmental conditions that may have affected settlement location selection, the results presented suggest that regional variability may have affected settlement location choice. This may suggest that prehistoric peoples preferentially selected locations based on their general productivity potential. Finally, the results may have predictive value as to the location of as-of-yet unknown sites, through a definition of the ecological conditions to support village farming; in-the-field testing will be required to confirm this.

Billman, Brian [70] see Bardolph, Dana

Billman, Brian (UNC & MOCHE, Inc) and Jesus Briceño Rosario (ICPAC and El Ministerio de Cultura, Peru)
[165] *Patrimonio y Comunidad en Perú: Archaeology as Social Engagement*

In 1997 we began a collaborating with communities on our research project on the interaction of ancient highland and coastal communities in the Moche Valley, Peru. Although conceived as a traditional research project with research questions and hypotheses, soon we realized that the archaeological heritage of the valley would not survive unless there were new preservation initiatives. We found the most effective means of heritage preservation was through community engagement. However community heritage preservation means engagement in the struggles of community members for self-respect and a better life. Archaeology can be a positive force in social change.

Billo, Evelyn [18] see Mark, Robert

Billo, Evelyn, Robert Mark (Rupestrian CyberServices) and Donald E. Weaver, Jr. (Plateau Mountain Desert Research)
[18] *Sears Point Rock Art and Beyond: 2008-2012 Recording Project, Arizona, USA*

Utilized for centuries by the Desert Archaic, Patayan and Hohokam Cultures, and perhaps Paleoindians, the National Register Sears Point Archaeological District (SPAD) is located along the rich riparian habitat of the lower Gila River. Currently managed by the Yuma Field Office of the Bureau of Land Management, the SPAD is within a designated Area of Critical Environmental Concern. It is still utilized by several Tribes that claim cultural affiliation there. Rupestrian CyberServices and Plateau Mountain Desert Research not only mapped over 2000 petroglyph panels and 87 features including rock piles, rock rings, artifact scatters, a rock shelter, hunting blind, geoglyphs, and scattered rock alignments; but also, many historic features and over 30 kilometers of pre-historic, historic, and animal trails. Recording SPAD required a four-year effort with help from 50 volunteers, and some unusual techniques such as photographing subtle features using balloons – both helium and hot air. Sears Point is considered a major regional gathering area, where surrounding people came together to collect food resources and participate in ceremonies. Documenting the features and analyzing their relationship to approximately 10,000 petroglyph elements increases our understanding of prehistory of the Sears Point region within the greater Colorado/Gila River System.

Bilton, David [170] see Letham, Bryn

Bilton, David (University of Toronto) and Danielle A. MacDonald (University of Toronto)

[227] *Manufacturing Mortuary Beads on the Northwest Coast: Applications of Quantitative Microscopy to Bead Assemblages*

Recent excavations north of Vancouver, Canada have uncovered human burials interred with small stone and shell disc beads. Two of these burials contained over 10,000 and 350,000 beads respectively, and date to c.4000 B.P., 1500 years earlier than other archaeological evidence for pronounced social inequality on the Northwest Coast. Although the beads from each burial appear similar, their metrics differ significantly, suggesting they were manufactured by separate craft communities or specialists. In this paper we test the applicability of laser scanning confocal microscopy for the quantification of surface texture resulting from unique manufacturing techniques and wear processes. This new method is used to link microscopic traces to unique gestures and techniques of past craft-people. Through the quantification of manufacturing traces at the microscopic level, details about the technological and social aspects of the bead burial tradition are

placed in context with the exchange of prestige items. Long distance exchange and trade networks of wealth items are described in ethnographies of the Coast Salish from the region. The development of these networks is seen as critical to the development of pronounced social inequality on the Northwest Coast and the bead burials could significantly contribute to our understanding of this emergence.

Binning, Jeanne (California Department of Transportation) and Joan Schneider (California Department of Parks and Recreation (Ret))

[250] *Poi Pounders in the Archaeological Record of the Hawaiian Islands*

Poi pounders, characteristic items of East Polynesian material culture, were important food-processing tools whose significance in Hawaiian society was not limited to their food preparation functions. These tools were highly curated and they are rarely found archaeologically. The material correlates of the manufacture-use-discard trajectory for poi pounders have not been well distinguished in the prehistoric record of the Hawaiian Islands. It is important that the use-life of this artifact type be made visible. To do so would contribute to a better understanding of prehistoric Hawaiian economic organization. This paper reports on efforts to better detect poi pounder manufacture and use in the archaeological record of Hawai'i.

Biondi, Franco [87] see Villagran, Victor

Birch, Jennifer (University of Georgia) and Ronald F. Williamson (Archaeological Services Inc.)

[65] *Navigating Ancestral Landscapes in the Northern Iroquoian World*

Recognizing responsibilities to communities of the living and the dead was an essential component of Huron-Wendat culture. Because Northern Iroquoians relocated their villages every 15-30 years the landscape they inhabited would have contained more abandoned than occupied village sites. In this paper we use archaeological and ethnohistoric data to explore processes of village abandonment and the experience of abandoned villages in precontact Iroquoia. We draw upon site relocation sequences on the north shore of Lake Ontario to address questions of why villages were abandoned and how conditions which prompted relocation changed from generation to generation based on historical and environmental contingencies. We will discuss how processes of village relocation and abandonment played out "on the ground" and how the formation of large community aggregates complicated these events, both in terms of logistics and decision-making. We also discuss how the continued abandonment of village sites created ancestral landscapes that included sites of pilgrimage, resource extraction and ceremony. As communities of the dead, abandoned villages were part of a larger set of spiritual responsibilities to meaningful places in the landscape.

Bird, Douglas (Stanford University)

[212] *Aboriginal Australians as Trophic Regulators: Fire, Hunting, and Niche Construction in the Western Desert of Australia.*

Western Australian deserts have many ecological features that suggest a deep history of co-evolution between humans, the resources they rely on, and the structure of the habitats they occupy. Here we present data illustrating how Martu foragers, Traditional Owners of a large region of Australia's Western Desert, serve as trophic regulators and apex predators, both in their hunting of mesopredator populations and in their fire-mediated disturbance of plant communities. The results of their daily patterns of subsistence create landscapes that are truly anthropogenic, and have likely co-evolved with a number of species that became extinct or highly vulnerable when Martu foraging patterns were disrupted. We find evidence of regulatory effects on mesopredator populations, increased availability and

diversity of habitat niches that favor endemic mammals, and reduced climate-related variability in fire size and severity in landscapes where Martu continue to frequently hunt and burn compared to landscapes dominated by a climate-driven fire regime. We explore the implications of the Martu pattern for recognizing the signatures of environmental engineering and anthropogenic landscapes archaeologically.

[2] *Discussant*

Birkenfeld, Michal (Institute of Archaeology, The Hebrew University of Jerusalem) and A. Nigel Goring-Morris (Institute of Archaeology, The Hebrew University of Jerusalem)

[162] *A Multi-Scale Approach to Pre-Pottery Neolithic Settlement Systems in the Lower Galilee, Israel*

The Pre-Pottery Neolithic period (PPN) in the Levant corresponds to fundamental social and economic changes: the emergence of large sedentary village communities, and the shift from foraging to food production. The PPNB (ca. 8,500-6,400 cal B.C.) represents the climax of Neolithization processes, when settlements in the Levant became larger and more densely populated and exchange systems intensified. Settlement and associated subsistence patterns, however, display considerable regional variability, as adaptations to local conditions in different regions contributed to the formation of distinct local patterns and a mosaic of subsistence modes.

The lower Galilee is a well-defined geographical unit providing an excellent opportunity to conduct integrated regional studies. Archaeological research in this area has been extensive. A long-term field project at the cult and mortuary center of Kfar HaHoresh forms the basis for comparative studies with neighboring village communities. It is hypothesized that social organization, interaction and change should be mirrored in both intra-site spatial and inter-site settlement patterning. The rich datasets available are amenable to GIS analysis facilitating study of the nature and structure of dynamic PPNB settlement systems in the Lower Galilee. These are examined at several scales ranging from inter- to intra-site as well as at regional levels.

Birnbaum, Michelle [25] see Calfas, George

Birnbaum, Michelle (University of Wisconsin - Milwaukee)

[25] *Characterizing North Bay Ceramic Pastes Using pXRF, XRD, and Optical Petrography*

The North Bay culture is a non-Hopewellian Middle Woodland manifestation definitionally restricted to lakeshore settings on Wisconsin's Door Peninsula and the southern Green Bay locale. The culture is primarily recognized by friable, thick-ware ceramics heavily tempered with coarse grit. Recently, the distinctive physical characteristics of this pottery have been used to identify ceramic materials and associated sites as North Bay in areas well outside the Door Peninsula core area. This paper reports preliminary results of a compositional analysis of North Bay pottery from within and outside the core area. Data was collected using a portable X-ray fluorescence analyzer (pXRF), X-ray diffraction (XRD), and optical petrography. Results are used to describe the ceramic paste composition typical of core area North Bay pottery and compare this characterization to pastes found in "North Bay" ceramics from outside the core North Bay area. Implications for our understanding of the Middle Woodland cultural landscape in the western Great Lakes and the degree to which North Bay groups interacted with other Middle Woodland middle tier cultures are discussed.

Bishop, Katelyn [68] see Lemoine, Ximena

Bishop, Ronald (Smithsonian Institution), James Doyle Doyle (Brown University), Socorro Jiménez Alvarez (Universidad Autónoma de Yucatan), Iliana Ancona Aragón (Universidad Autónoma de Yucatan) and James Blackman (Smithsonian Institution)

[288]

Middle–Late Formative Maya Ceramics: Circulation or Local Production?

Middle to Late Formative pottery, especially that of the Sierra Red and Juventud ceramic types, occur at many sites throughout the Maya Lowlands and in the upper reaches of the Usumacinta and Grijalva river drainages. Compositional research during the past half-decade has begun to show distinct manufacturing districts that are used to infer a sharing of technological knowledge and differential use of tempering materials. The study is anchored on the Trinidad region of the lower-middle Usumacinta from which subregional variation can be assessed during this early period of societal growth.

Biskowski, Martin (California State University, Sacramento) and Jessica Jones (California State University, Sacramento)

[250] *Early Formative Grinding Tools at Paso de la Amada*

Despite the centrality of grinding tools in later Mesoamerican households, the early growth of this industry has received little analytical attention. Recent studies of grinding tools from Paso de la Amada provide a picture of this industry during its Early Formative development. Since dependence on maize was still emerging, the grinding tools often are small and comparatively simple in design. Interestingly, many tools are gracile and extremely well-shaped. These tools not only are incompatible with heavy grinding use but also display a degree of workmanship consistent with symbolic display and perhaps feasting. They contrast sharply with cruder, heavy-duty tools commonly found in later Middle Formative contexts.

Bisson, Michael (McGill University), April Nowell (University of Victoria), Carlos Cordova (Oklahoma State University), Melanie Poupart (McGill University) and Christopher Ames (McGill University)

[162] *Dissecting a Lower and Middle Paleolithic Palimpsest on the Madaba Plateau, Jordan*

WZM-2, a Paleolithic flint-source on the Madaba Plateau, Jordan, has a complex history of deposition, erosion and colluvial movement of sediments that altered the spatial relationships of artifacts. This created a cumulative surface palimpsest with limited stratigraphic integrity below surface. Techniques for investigating these types of disturbed sites are discussed, including transect surface collections, systematic total collection of grids, and geological and archaeological test trenches. In order to identify the parts of the Paleolithic sequence present, the WZM-2 assemblage was subject to spatial analysis using ARC-GIS and statistical analysis of technological attributes combined with the identification of artifact types and techniques of manufacture known to have chronological significance. With the exception of a Late Pleistocene - Holocene chipping area at the northeastern end of the site, WZM-2 is primarily a Middle Paleolithic lithic acquisition and processing site, dating to MIS-5, with some exploitation during the preceding late Lower Paleolithic Acheulo-Yabrudian. Although the disturbed nature of many open-air sites limits the types of behavioral information that can be obtained, their location on the paleo-landscape as well as the aggregate characteristics of their assemblages can provide important clues to early hominin land-use patterns, economies, and provisioning strategies.

Bisson, Michael S. [224] see Ames, Christopher

Bisulca, Christina (The Bernice Pauahi Bishop Museum, Department of Conservation), Kamalu du Preez (Department of Cultural Collections, The Bernice Pa), Lisa Schattenburg-Raymond (Department of Cultural Collections, The Bernice Pa) and Betty Kam (Department of Cultural Collections, The Bernice Pa)

[5]

Dye Analysis of Hawaiian Barkcloth

There have been only a handful of scientific analyses to determine the colorants used in Polynesian barkcloth. Hawaiian barkcloth (kapa) is unique in the Pacific due to its broad range of colorants

derived primarily from native plant sources. After western contact, kapa was gradually replaced by imported textiles and the practice waned during the 19th century. Today, most of the materials and methods known about traditional kapa manufacture are from historic descriptions by early missionaries and explorers. Modern methods of analysis can now provide more definitive data on these ancient practices. The Bishop Museum has initiated an investigation into the identification of the dyes, resins and pigments in kapa. The Bishop Museum holds the fullest collection of kapa, including some of the earliest pieces collected from Cooks voyage in the 18th century. Analyses are primarily focused on determining the dye sources using high performance liquid chromatography (HPLC), which can identify dyes with exceedingly small samples. HPLC results to date show that traditional dyes are primarily extracts from noni (*Morinda citrifolia*) or turmeric (*Curcuma longa*), confirming some early historical accounts. This study also explores how imported materials are incorporated into kapa in post contact Hawaii.

Bisulca, Christina [139] see Santarelli, Brunella

Black, Kevin (History Colorado)

[206] *Landscape Use in the Pawnee Buttes Area, Colorado*

A sample survey in the Pawnee Buttes area of Weld County, northeastern Colorado was initiated in June 2012 with several goals in mind: evaluating a predictive model of tipi ring locations, establishing potential site impacts from increasing oil-and-gas development, and training volunteers in field survey and site recording methods. Previous research had suggested that prehistoric site density may be lower in zones closer to the Pawnee Buttes themselves, perhaps because these visually prominent landforms were considered sacred spaces in at least some time frames. Results to date define settlement trends of dispersed hunting stations on slopes below the crests of hills and ridges, camps in proximity to larger drainages at a distance from the buttes, and sites with possible ritual features on prominences with expansive viewsheds. Long-term use of Flattop Butte chalcedony at the primary procurement area located 52 km east of the buttes also may partly explain the skewing of site distributions from west to east across the region. Recent inventory data from large pipeline projects in northeastern Colorado will be incorporated to further define the nature and extent of prehistoric landscape use in this area.

Black, Cullen and Joshua Toney (Joint POW/MIA Accounting Command)

[251] *Sociopolitical Organization, Memory, and Landscape in the Search for Missing U.S. Service Members from the War in Vietnam*

Since 1973, the Department of Defense has been actively searching for the remains of missing U.S. service members from the War in Vietnam. In this paper, the authors examine past investigations and recovery efforts in the Socialist Republic of Vietnam to shed light on the challenges associated with locating and recovering remains from a variety of interment scenarios. The attendee will gain insight into the dynamic social structure and interaction between informants, political leaders, and American investigators. The collective memory of the local informants, communities, and former military and militia groups will be explored. In addition, the impact population expansion and major infrastructure development have on recovery efforts at potential burial sites will be addressed.

Blackman, James [288] see Bishop, Ronald

Blackmore, Chelsea (University of California, Santa Cruz)

[100] *Poverty of Interpretations or Ancient Maya*

Poverty?

Feminist and household perspectives in ancient Maya studies have led to an increasing interest in the everyday lives of lower status peoples. Commoners, in particular, are characterized by wealth, or more specifically their lack of wealth. Although access to resources and material goods often define differences in class position, we rarely include the concept of poverty in our discussions. In this paper, I explore two primary questions: 1) Is the concept of poverty applicable to prehistoric state societies like that of the ancient Maya? And 2) How do neo-liberal conceptions of class mobility affect archaeological interpretations of class structure and commoner agency?

Blackwell, Bonnie A.B. (Williams College & RFK Science Institute), Ada L. Huang (RFK Science Research Institute), Maurice Hardy (CNRS, Nanterre, France), Francine David (CNRS, Nanterre, France) and Clare Tolmie (University of Iowa)

[96] *ESR Dating in a Mousterian Layer at Grotte du Bison, Arcy-sur-Cure, France*

A partially collapsed cave with an extant gallery and another 30 m² of deposits out front, Grotte du Bison opens facing south atop a small cliff 6 m above the Cure. Mousterian and Châtelperronian layers have produced hearths, ochre, manuports, and lithics, including bifaces, scrapers, cortical and retouched flakes. Levallois technology dominated the Charentian Mousterian industry, made mainly on flint and silcrete. Most cores and tools, mainly sidescrapers and endscrapers, were found in the main gallery or outside. Inside, roughly equal numbers of reindeer, horse, and bovid fossils occur, plus birds, fish, some larger herbivores, and carnivores. Pollen analyses suggest a cold steppe. The Mousterian layers have yielded 20 human remains, including a partial adult maxilla, isolated permanent and deciduous teeth. One Equus tooth was ESR dated from Couche I in the Mousterian layers. The external dose rate was determined by measuring the radioactivity in five associated sediment samples, assuming no cosmic dose given the sample's position deep within the cave. U in the enamel ranged from 0.16-0.25 ppm, while dentinal U ranged from 3.73-17.13 ppm. Isochron analysis suggests that some U remobilization has occurred recently. Nonetheless, the mean LU ages correlate well with late Oxygen Isotope Stage 3.

Blagg, Jennifer (Connecticut College Computer Science), Anthony Graesch (Connecticut College) and Christine Chung (Connecticut College)

[205] *Exploring Cultural Heritage with Digital Strata: An Application of Open-Source Mediated Reality (MR) in Southwestern British Columbia, Canada*

This poster highlights a collaborative, interdisciplinary project that marries the technical and design-based expertise of computer science with the goals of anthropological, community-focused research for the purpose of placing the dissemination of heritage information firmly in the hands of local communities. The recent innovation and influx of portable consumer electronics with substantial processing power and multi-media digital capabilities affords opportunity to disseminate heritage-related information, including the results of archaeological research, to much wider audiences. This poster focuses on one example - mediated reality (MR) - as applied in southwestern British Columbia. When coupled with the philosophies underlying open-source software and open-community online projects, MR applications for smartphones can aid substantially in (1) the pursuit of educational and outreach goals, including cultural tourism, and (2) resolving inequities in the authorship of local histories. To date, the production of MR applications, such as paddle- and smartphone-aided tours available in museums, has been the province of costly specialized software firms. Open-source MR programs are an important step toward decolonizing heritage management and are an effective medium for indigenous groups to selectively share information

about landscapes, sites, and features, among other tangible and intangible attributes of local cultures.

Blain, Hugues-Alexandre [215] see Agustí, Jordi

Blair, Susan (University of New Brunswick) and Melanie Wiber (University of New Brunswick)

[24] *Ancient "Mesh Societies"? What Augustine Mound Can Teach Us About Deconstructing Centers and Boundaries*

Hierarchy is inherent in models of space and time, as is illustrated by "core-peripheries", and ideas of diffusion and progressivist change. Despite lack of evidence, widespread archaeological manifestations are often implicitly configured as having dominant centers, subordinate edges, and boundaries. In the "far" Northeast of North America, archaeological phenomena such as "Adena" are assumed to spread from a center in the Midwest to the Canadian Maritimes. This is despite evidence from local Early Maritime Woodland assemblages, such as the Augustine Mound, of material and ideological richness, and the balancing of local contributions with uptake of non-local materials and forms. We argue that dominant narratives of hierarchy derive from normative histories and long-standing archaeological constructs, but also from hierarchical epistemologies that are a part of a Western worldview. This perspective naturalizes top-down, centered networks as the primary organizing principle for large collectives of people. In this paper we explore recent work by Escobar and others who propose models of decentered meshworks as a methodological mechanism for understanding large-scale interrelationships between small-scale collectives and individuals, and as tools for deconstructing edges and centers. The implications are both methodological and theoretical.

Blair, Elliot (UC Berkeley)

[227] *Elemental Analysis of Glass Beads from Mission Santa Catalina de Guale*

Glass beads have long been one of the most abundant and important artifact classes available to historical archaeologists working in the Americas. This is certainly true at Mission Santa Catalina de Guale, a 17th century Spanish Mission from La Florida (St. Catherines Island, GA), where almost 70,000 beads have been recovered during excavations by the American Museum of Natural History. While this large and diverse collection includes beads manufactured from around the globe, many of which are diagnostic and/or stylistically unique, the bulk of the collection consists of glass beads of simple construction—widely considered to be relatively non-diagnostic. This paper discusses the ongoing analysis of these "non-diagnostic" beads using X-ray fluorescence spectrometry (XRF), demonstrating how elemental analysis can expand the interpretive potential and transcend the "humility" of these things. Specifically, at Mission Santa Catalina detailed bead compositional data are allowing architectural and mortuary chronologies to be refined, our understanding of global trade networks to be enhanced, and intra-community social relationships to be explored.

Blake, Michael (University of British Columbia)

[4] *Discussant*

Blancas, Jorge [166] see Carballo, David

Blancas y , Jorge [231] see Barba, Luis

Blanco, Jessica (Northern Illinois University)

[86] *Further Analysis of San Marcos Subsurface Material: What Material Culture Can Tell Us about Demography and Social Complexity*

The American Southwest is a well-documented area, however, population size and the questions of whether an intricate social hierarchy was in place is still questioned. The following research presents a collections-based investigation approach to analyzing demography and social complexity of San Marcos Pueblo, located in New Mexico, via excavated material culture from 1990 excavation collection currently housed at the Field Museum in Chicago, Illinois. The collections were used in recording the date of occupation of twenty-five room blocks, for which sample dates are available, examining whether or not all room blocks were occupied simultaneously or sequentially. Moreover, room function is analyzed via the represented materials and identified materials that may indicate inequality and social complexity. Diagnostic ceramic rims were used to identify population shifts within the site. Six groups were identified. Group one corresponds with migration into the southwest section of San Marcos. Groups two and three correlate with a shift east. Groups four, five and six shifted to the northeast and northwest section of San Marcos. Ground stone, chipped stone and bone may correlate with social complexity, specifically room function and identifying markers symbolizing status difference. Nevertheless, evidence for social complexity at San Marcos remains limited.

Blanco, Ericka

[107] *Los procesos y sus permanencias. El caso de la Isla de Atilán en el Occidente de México*

La antigua configuración lacustre de la zona Valles de Jalisco ha permitido el desarrollo de importantes fenómenos sociales a lo largo de más de cinco milenios. En las últimas décadas se han registrado una cantidad importante de asentamientos prehispánicos que reflejan diversidad socio-política, económica, ideológica y cronológica. El presente trabajo coloca bajo la lupa a la Isla de Atilán, área que nos invita a explorar la zona bajo el enfoque de las permanencias. La isla se ubica dentro de la extinta Laguna de Magdalena, donde los materiales de superficie reflejan una ocupación continua. Entre ellos destaca una zona de desecho de objetos de obsidiana que se extiende por varias hectáreas. Ello sugiere que desde su aparición fue reutilizado posiblemente hasta la llegada de los españoles. Este hecho permite formularnos importantes interrogantes en torno a los procesos de transformación social que se desarrollaron en la zona. Será pues la tarea primordial de esta investigación determinar la naturaleza de la acumulación de obsidiana, para explicar cuáles características son las que priorizan a la isla para desarrollar la misma actividad, y por qué dicha práctica no presenta modificaciones sustanciales pese a los cambios socio-políticos que se presentan en el resto de la zona.

Blanco, Monica

[231] *El ritual en contextos domésticos de Xochitécatl-Cacaxtla*

El presente trabajo se centra en una unidad habitacional del período Epiclásico: "La Casa del Pórtico". Localizada a 500 metros en línea recta de Cacaxtla, la ubica en un punto estratégico. A diferencia de otras unidades habitacionales en donde se ha documentado la presencia de actividades productivas –Casa de los Mezcaleros, Casa de los Lapidarios (Serra y Lazcano 2011), La Casa del Pórtico destaca por algunas particularidades que han sido el motivo principal para ahondar en temas relacionados con validar una interpretación basada en datos precisos tanto de excavación como de análisis de materiales, con especial interés en el contexto de nuestra evidencia. La Casa del Pórtico conjuga dos aspectos: la evidencia arqueológica nos aporta información para validar el calificativo de unidad habitacional residencial. Por otro lado, a pesar de la complejidad no encontramos evidencia de algún tipo de actividad productiva como en otros complejos habitacionales del sitio. Entrelazando los datos obtenidos tanto en campo como en laboratorio, haciendo énfasis en el contexto de los elementos, detectamos una serie de características que nos sugieren una actividad de carácter ritual, misma que está incidiendo económica

y socialmente en la región.

Blanford, Adam (University of Colorado Boulder)

- [234] *Rethinking Tarascan Political and Spatial Organization*

The Tarascan (Purépecha) Empire ruled much of west Mexico during the 15th and 16th centuries AD. Through ethnohistorical texts like the Relación de Michoacán, the Tarascans described their empire as a tripartite alliance between the settlements of Tzintzuntzan, Ihuatzio, and Pátzcuaro. The lords of these settlements expanded Tarascan political influence throughout west Mexico, and established subordinate lords in settlements throughout the territory. However, scholarly interpretations suggest that the Tarascan Empire did not fully develop until lord Zizispandaquare consolidated political and religious authority at Tzintzuntzan, making it the sole capital of the Tarascan Empire. Though Ihuatzio and Pátzcuaro played important roles in imperial formation and continued to play important roles until the Spanish Conquest, they are often overlooked. Recent research uses ethnohistorical texts as narratives of indigenous history to evaluate imperial development from the native perspective, while archaeological and remote sensing data are evaluated in light of these new ethnohistorical interpretations. These data are used to propose an alternative model of Tarascan organizational structure.

Blanton, Dennis (University of Virginia)

- [124] *Evolution of a Ritual: Pipes and Smoking in Etowah's Realm*

The reasons religions change and the processes by which those changes occur may both be explored through the study of ritual. Here those issues are examined in the context of late prehistoric Mississippian societies in the southeastern United States, specifically within the realm of Etowah, which was one of the preeminent political and religious centers of the region. A progression of changes in both the physical form of smoking pipes and their contexts of discovery reveals how the rite was differently controlled and performed in accordance with varying social, political, and economic circumstances.

Blanton, Richard (Purdue University) and Lane Fargher (CINVESTAV del IPN)

- [231] *Pottery, Production, and Politics at Late Postclassic Tlaxcallan*

Studies have demonstrated that, during the Late Postclassic, Central Mexico was a key economic region, marked by intensive agriculture, extensive craft specialization, and complex interlocking markets. Much of our understanding of this highly commercialized landscape comes from extensive archaeological and ethnohistoric research in the Basin of Mexico and Morelos. Tlaxcala, which was identified by the Conquistadores and early chroniclers as a major market place and economic force, has largely been ignored. We begin to fill this lacuna by describing the ceramic economy of the Late Postclassic city of Tlaxcallan. We burrow further into our collections and surface data to elucidate how ceramic production, distribution, and consumption were organized. Combining petrography, systematic measurements of vessel uniformity, and surface evidence of intensive production, we demonstrate that the ceramic economy of Tlaxcallan was highly commercialized, especially with respect to polychrome pottery. As such, Tlaxcallan may have been the largest center of polychrome production in Central Mexico, exceeding the better-known centers of Cholula and Chalco in importance. However, we also consider the iconographic content of Tlaxcallan polychromes and suggest that the consumption of Tlaxcallan vs. Cholulteca or Chalco polychromes signaled political and ideological affiliations as well as marked social boundaries.

- [133] *Discussant*

Blasing, Robert [276] see Bement, Leland

Bleed, Peter (University of Nebraska-Lincoln) and Daniel Osborne (University of Nebraska-Lincoln)

- [212] *Searching Lithic Technology and the Complex Control of Food for the Roots of Human Niche Construction*

Viewing humans as culturally enabled "niche constructors" has helped archeologists understand ecological adjustments made by people and species that interacted with them. Reference to the ability of humans to alter their situation and aggressively embrace modifications of their own creation, however, fails to explain the basis of these principles of human evolution. Using interaction models, this paper considers two archeologically observable behavioral complexes that differentiate humans from other mammals and that lie at the base of aggressive niche construction. Commitment to chipped stone tool technology increased hominid technical impacts, enhanced analytical cognitive ability, keyed early hominids to resource assessment and distribution, and made transportation of materials a significant human behavior. Human eating behavior, featuring complex control of food availability and socially structured management of consumption, increased niche modification by encouraging storage, transportation, and focused interaction with specific resources.

Blessing, Meggan [54] see Wallis, Neill

Bliege Bird, Rebecca [212] see Bird, Douglas

Blitz, John (University of Alabama)

- [178] *Skeuomorphs, Textured Pottery, and Technological Innovation*

Behaviorist and selectionist ceramic technology studies identify texture applied to vessel surfaces, such as corrugation, impressing, and stamping, as utilitarian attributes to be evaluated by performance efficiency. I reject this conclusion because the laboratory experiments are based on the unsubstantiated inference that textured surfaces are utilitarian performance characteristics. I propose that textured ceramic surfaces are skeuomorphic decorations that mimic and reference other containers such as woven baskets or fabric bags. Skeuomorphs originate as design elements that were functional on the prototype artifact but through time become non-functional decorative attributes on a derivative artifact. I review the evidence for ceramic skeuomorphs in the archaeological record and discuss the role of skeuomorphs in technological innovation. Skeuomorphs facilitate acceptance of innovations by evoking valued social memories and identities linked to the prototype artifact. By materializing the pre-existing familiar value as a decoration transferred to unfamiliar innovations, skeuomorphs extend the frame of reference to new objects and create new value by association and connotation.

Blomster, Jeffrey (George Washington University)

- [145] *Urbanism and Production in the Mixteca Alta: The Yucuita Phase at Etlatongo, Oaxaca, Mexico*

Transformations in social-political organization occur throughout the state of Oaxaca during the Late and Terminal Formative periods. Urban societies appear in various regions of Oaxaca along with associated changes in socio-political and economic organization. In addition to monumental architecture and public art, these larger changes were materialized in pottery, objects that dominated domestic assemblage from all socio-economic positions. The recent definition of the Yucuita phase, from 500 to 300 B.C.E., at the site of Etlatongo, in the Mixteca Alta of Oaxaca, allows for comparisons of ceramic forms and production with materials from the preceding ceramic phases. This paper explores

changes in production through a focus on paste and non-plastic inclusions, forms, surface treatment, and decoration. From the Cruz B phase (1150 – 850 B.C.E.) to the Yucuita phase, these comparisons indicate changing emphasis in aesthetics and the surface of pottery in the Early Formative to a focus on more consistent production of pottery in the Middle/Late Formative, which may signal changes in the ceramic industry and socio-political organization. These changes also track with visual imagery materialized in ceramic figurines from the same time periods.

[145] *Chair*

Blount, Clinton [119] see Peelo, Sarah

Bloxham, Megan [87] see Pitblado, Bonnie

Bluma, Jacquelyn [40] see Laak, Emily

Bluma, Jacquelyn and Alexis Jordan (University of Wisconsin-Milwaukee)

[158] *An In-depth Comparison of Immigrant Life Expectancies from German Lutheran Cemeteries in Southeastern Wisconsin*

Understanding differential life expectancies within and between immigrant populations during the nineteenth century in Southeastern Wisconsin provides a window into long-term patterns of social and political disparities. As these disparities played out, they were reflected in the mortuary record in both cultural and physical attributes. This analysis is anchored by an examination of life expectancies between local German Lutherans during the mid-nineteenth to early twentieth century. Comparisons of osteological traits are contextualized within the larger framework of Southeastern Wisconsin German Lutheran cemeteries. This data comes from individuals disinterred from two cemeteries in Ozaukee County and is supplemented with textual material from adjacent regions.

Blyth, Tania [260] see Pelletier, Natalie

Boaretto, Elisabetta [79] see Alex, Bridget

Bobbit, Mary [120] see Auge, C Riley

Bobbitt, Mary (University of Montana), C. Riley Auge (University of Montana), T. A. Foor (University of Montana) and Kelly J. Dixon (University of Montana)

[120] *Interpreting the Intra and Extra Regional Trade Networks at the Bridge River Site*

Indigenous cultures of the Pacific Northwest were dramatically impacted by trade goods that came to the region during the 18th and 19th centuries. Trading posts were subsequently established throughout this region, and by 1792 maritime fur trading activities between indigenous people and Europeans were well underway. Recent field work lead by Dr. Anna Prentiss at the Bridge River site (EeR14), located in the Middle Fraser Canyon of Southern British Columbia, has yielded a small percentage of artifacts that correlate to the period associated with early European – First Nation interactions. Objects such as iron spear points, flat glass, and beads from Housepit 54 at the site are suggestive of ways in which materials introduced by Europeans made their way to local households. Here we examine these artifacts in order to explore the ways in which traditional people in the Middle Fraser Canyon incorporated trade materials into their everyday lives, underscoring the implications such information has for understanding the intra and extra-regional trade networks.

Bobe, René [28] see Hovers, Erella

Bobe, Rene (George Washington University), Amelia Villaseñor (George Washington University), David Patterson (George Washington University) and Andrew Du (George Washington University)

[215] *Geographic and Temporal Variation in Plio-Pleistocene East African Mammals*

Hominins were part of rich Plio-Pleistocene faunal communities that underwent significant shifts over time. Here we analyze and compare faunal data associated with hominins from three time periods in the East African Plio-Pleistocene. The earliest interval at 3.4 million years ago (Ma) is well documented in the Hadar Formation, Ethiopia, where *Australopithecus afarensis* is the dominant hominin. However, this species is rare in contemporaneous deposits in the Turkana Basin of Kenya. One million years later we find traces of early Homo at Hadar and also in the Turkana Basin, in deposits dating to 2.4 Ma. Faunal data from both areas indicate significant changes in the faunas associated with these hominins relative to those associated with earlier *Australopithecus*. The third time interval considered corresponds to the Okote Member of the Koobi Fora Formation, Kenya, dated to about 1.5 Ma. Both *Paranthropus* and *Homo* are common in the Okote Member, and faunal associations indicate further changes in the environments of these taxa relative to those of earlier hominins. Comparisons of faunal associations among hominins and other species during this time contribute key data to discussions of variation in habitat preference among hominins and their ability to disperse into new habitats.

Bocancea, Emanuela (Joukowsky Institute for Archaeology & the Ancient World, Brown University) and Krysta Ryzewski (Department of Anthropology, Wayne State University)

[257] *Early Lessons on Archaeology: Teaching Archaeological Stewardship to Young Students on the Caribbean Island of Montserrat*

Teaching archaeology on the island of Montserrat is a challenge intertwined with ongoing disaster recovery, initiated by the 1995 volcanic eruptions. Montserrat's archaeological heritage management is marked by larger Caribbean-wide inconsistencies in legislation, training, education, and curation. The island lacks a university and has no trained archaeological or heritage professionals employed in its cultural resource, tourism, or education sectors. Given these circumstances, we place emphasis on training Montserratian students from an early age, with the aim of developing a base for archaeological heritage management in the next generation. Since 2011 we implemented an education program in primary schools, and organized events at the National Museum and annual Career Fair. We aim to cultivate students as stewards of the island's archaeological heritage, and to raise community awareness about Montserrat's fragile and threatened archaeological resources. Our flexible teaching strategies are designed to negotiate the island's shifting heritage values, a variety of age groups, a rich but largely undocumented archaeological history, and the socio-economic pressures of disaster recovery. Throughout this process we confront our own education as we adapt pedagogical strategies from American university to Montserratian primary school and community contexts. This paper discusses the successes, challenges, and lessons of these initiatives.

Bocancea, Emanuela [264] see Leppard, Thomas

Bocinsky, R. Kyle [23] see Reese, Kelsey

Bocinsky, R. Kyle (Washington State University)

[206] *The Defensive Coast*

Recent attempts to create an index of site defensibility for the Northwest Coast and elsewhere have used a null model of zero

defensibility; i.e., the site does not have any defensive advantage when approached from its immediate surroundings. Such a model is useful for comparing sites to one-another, but does not necessarily reflect an agent's consideration of defensibility when choosing a place to be on a landscape. Instead, people make decisions in the context of their local and regional environments: their set of possible choices. In order to understand the importance of defensibility in past peoples' behavior, we must first quantify the defensibility of their landscapes. In this paper, I build off a defensibility index developed by Martindale and Supernant (2009) by fully specifying their geospatial indices pertaining to visibility and elevation and adapting them to a raster landscape (a digital elevation model). I then examine the defensibility of recorded pre- and post-contact archaeological sites in the Gulf of Georgia and lower Fraser River valley of British Columbia in light of the baseline defensibility of the landscape. By doing so I am able to consider to what extent peoples' initial decisions of where to build are defensive.

Boczkiewicz, Roberta [263] see Jeske, Robert

Boehm, Andrew (Southern Methodist University)

[68] *General Trends in Bison Foraging on the Great Plains over the Last 13,000 Years*

The American bison was a key resource for Great Plains groups for over 10,000 years. The ubiquity of bison in the archaeological record across the millennia suggests that bison were a predictable resource throughout this period. To examine this proposition, I developed a database of published carbon, nitrogen, and oxygen isotope values derived from bison and covering a 13,000-year record for the entire Great Plains. General trends observed in the bison isotope database are compared to previous studies on soil organic carbon to examine the variability in bison foraging preference over time. Increased variability in carbon values likely signifies that bison were forced, either by climatic changes or predation, to consume plants outside their preferred forage, which may be an indication of periods when bison were less predictable. In response to unpredictable bison behavior, human groups were potentially forced to expand their diet breadth during these periods.

Boesch, Christophe [38] see Fahy, Geraldine E.

Bogaard, Amy [32] see Carter, Tristan

Bogucki, Peter (Princeton University)

[211] *"Disruptive Technologies" and the Transition to Agriculture in Northern and Western Europe*

The transition to agriculture in northern and western Europe took place over a millennium later than the establishment of farming communities in adjacent central Europe, but then occurred quickly just after 4000 BC. This paper explores the proposition that certain elements of the agricultural economy from central Europe presented themselves to the foragers in the British Isles and Scandinavia as "disruptive technologies," innovations that rather than improving existing processes and products introduce novel techniques that exploit hitherto-unused economic niches. A possible candidate for such a disruptive technology derived from the central European Neolithic economy could have been the use of cow's milk and its processing into derivative products, a novel practice that may have appealed to some foragers and opened the door for other agricultural practices.

[211] *Chair*

Boivin, Nicole (University of Oxford)

[146] *Mobile Societies and Archaic Globalization in*

the Early Indian Ocean

The Indian Ocean littoral saw the gradual emergence of networks of commercial exchange and cultural interaction beginning in the Bronze Age. The genesis of early trade activities in this arena is normally understood within the framework of a state-oriented system, defined by the activities of markets, governments, and state-based merchants. Omitted from most analyses is consideration of the more mobile societies that frequently played a key role in the acquisition and physical movement of trade products. In the Indian Ocean world, such societies fed into commercial networks a range of forest, sea, and highland products, most notably the highly sought after 'spices' widely used in the ancient world for medicinal, ritual, and symbolic purposes. They also played an overlooked role in transporting trade products, sometimes over significant distances and in surprisingly large craft. It is suggested that models of early globalization need to take into account the synergistic relationships that were established between settled and mobile peoples, and the misleading impressions of isolation and passivity that frequently serve, along with taphonomic and historical biases, to mask the activities of these early agents of globalization.

[146] *Chair*

Bollwerk, Elizabeth (University of Virginia)

[29] *From Cultural Complexes to Complex Social Topography: A History of Spatial Approaches to Native Cultural Landscapes in the Middle Atlantic*

Over the past 150 years Middle Atlantic archaeologists have used a variety of spatial approaches to depict past Native social landscapes. The primary model used throughout the early twentieth century generated cultural group territories encompassing hundreds of miles. In the second half of the twentieth century the Midwestern Taxonomic System and Cultural Complexes were in vogue. While these approaches emphasized different material traits, the predominant use of cultural territories and complexes to depict prehistoric archaeological cultures modeled past Native societies as isolated, static, and rigidly bounded. In the last half of the twentieth century and the first decades of the twenty-first century Middle Atlantic archaeologists have provided alternatives to previous depictions by using different methodological and theoretical approaches and interpretative frameworks when considering variation in Native material culture. These approaches have revealed dynamic aspects of Native social landscapes that were overlooked by previous models. However, the acknowledgment of social complexity introduces the challenge of how to depict the more intricate social networks of past Native communities. The conclusion of this paper will explore what archaeologists can learn from Digital Humanities approaches to Geographic Information Systems to improve the cartographic conventions we use to illustrate Native social topography.

[124] *Discussant*

[124] *Chair*

Bolnick, Deborah [140] see Overholtzer, Lisa

Bond, Stanley

[280] *Changing Traditions in Hawaiian Rock Art: Examples From Kaloko-Honokohau National Historical Park*

After contact Hawaiians quickly incorporated European goods into their material culture. Items especially sought by the ali'i (Hawaiian chiefs) included weapons for island conquest and ships to transport large numbers of warriors. These objects were described by native Hawaiian historians in their writings and incorporated in both traditional and non-traditional ways into Hawaiian rock art. Analysis of specific images; such as ships,

cannons, and muskets; and placing these images within the larger context of full petroglyph panels and Hawaiian interpretation of their history may provide some insight into the cultural significance of these new acquired European items.

Bonsall, Clive [227] see Gurova, Maria

Bonstead, Leah [206] see Hudson, Erin

Boon, Andrea [173] see Neusius, Sarah

Boor, Jocelyn (University of Wisconsin-Milwaukee)

[25] *Compositional Analysis of Bronze Age Ceramics from Tell Hadidi, Syria: A Comparison of Three Data Sets*

Compositional analysis of a sample of Bronze Age pottery from the site of Tell Hadidi in northern Syria was conducted using portable X-ray fluorescence analyzers (pXRF) as well as ceramic petrography. Data on 337 vessels recovered from Area C, a presumed ritual activity locus, was collected using NITON XLT3 and Bruker Tracer IIIv+ handheld units. These data were used to establish geochemical signatures for clay types and sources, test the relative chronology established for Area C, and determine whether certain vessel forms can be linked to specific clay mixtures. A comparison of the pXRF analysis to data derived from petrographic analysis of ceramic thin sections highlights the need to conduct complementary sets of compositional analyses whenever possible.

Borck, Lewis [106] see Mills, Barbara

Borck, Lewis (University of Arizona)

[218] *They Sought a Country: Gallina Resistance and Identity in the New Mexican Highlands*

In this presentation, I will examine the Gallina culture (A.D. 1100 – 1300) of northern New Mexico and, using them as a type study, will argue that our inability to fit them nicely into modern archaeological taxonomies is the result of their intentional refusal to conform to the characteristics of much more densely inhabited neighboring regions. Using the Gallina, I define a cultural form, which when present is frequently the product of cultural resistance, called atavism. Atavistic cultures are often less populous than their neighbors and use purposeful isolation, traditional technologies and rituals, and invented traditions to produce a society whose connection with the past, both real and constructed, functionally opposes the trending cultural currents of the day. Modern cultures which display traits of atavism will be discussed and comparisons to the Gallina will be drawn.

Boric, Dusan (Cardiff University), Emanuela Cristiani (University of Cambridge), Zvezdana Vusovic-Lucic (National Museum, Niksic) and Dusan Mihailovic (Belgrade University)
[80] *Upper Paleolithic Marmot Hunting in the Dinaric Alps: Late Glacial Recolonization of Montenegrin Mountains?*

The Balkans is often considered a refugium of European foragers during the Last Glacial Maximum (LGM), along with possible importance of the North Adriatic Plain as an area that might have seen the concentration of resources and human groups. Yet, the topography of large areas of the western Balkans is characterized by extensive mountain ranges known as the Dinaric Alps with many high altitude locations. The character of human occupation before, during and after the LGM in this region is poorly understood if compared with the Italian Alps and Prealps, where research to-date has provided more detailed information about human responses to changing climatic conditions in the course of the Late Pleistocene and early Holocene. Recent archaeological research in the mountainous areas of western Montenegro has

identified marmot hunting dated to the Late Glacial interstadials and may suggest a process of recolonization of higher altitude locations after the LGM. This specialized focus on marmot hunting in the southern Dinaric Alps is comparable to several similar sites previously identified in the Alpine region.

Boric, Dusan [250] see Cristiani, Emanuela

Borrazzo, Karen [26] see Borrazzo, Karen

Borrazzo, Karen (CONICET-IMHICIHU, UBA), Karen Borrazzo (CONICET-IMHICIHU, UBA), Marcelo Cardillo (CONICET-IMHICIHU, UBA) and Judith Charlin (CONICET-IMHICIHU, UBA)

[26] *Spatial Patterns in Late Holocene Lithic Technology of Tierra del Fuego: Evidence from Raw Material and Projectile Point Variations*

This presentation focuses on the study of lithic raw material distribution and morphological variations in lithic projectile points during the Late Holocene in Tierra del Fuego (Patagonia, Southernmost South America). The main goal of our study is to explore and discuss the regional distribution of some raw materials with focal availability, and the spatial patterns of projectile point size and shape variation throughout the Grande Island and neighboring areas. Raw material study is based on petrographic, geochemical and technological analyses. Projectile point size and shape variations, as well as its geographical patterns of distribution, are assessed through geometric morphometrics and spatial analyses. The results of raw material analyses points to the existence of a wide social network that integrated distant spaces within the Island, archipelago and the mainland. In contrast, despite the short geographic distance recorded among some of the samples considered, there are significant differences in projectile point variations, which exhibit spatial structuration. These results highlight the different scales of social boundaries and interaction among Fuegian hunter-gatherer populations during the Late Holocene.

Borrero, Luis (CONICET)

[26] *Discussant*

Borrero, Luis [26] see Morello Repetto, Flavia

Borrero, Mario (California State University Northridge) and Michael Love (California State University Northridge)

[171] *Domestic Obsidian Production and Consumption at the Middle Preclassic Site of La Blanca, San Marcos, Guatemala*

The Lithic analysis of household debitage from the Middle Preclassic (900-600 B.C.) site of La Blanca, Guatemala, is reported. Questions concerning possible elite control and restriction of distribution of obsidian as a resource, and access to different stages of tool stone production in varying functional contexts, are the primary focus of the study. Excavations in residential zones at La Blanca show significant social differentiation at the household level. The households are ranked, which has been determined by the densities and quality of: prestige goods, architecture, faunal remains, and ceramics. These differences carry over into the lithic assemblages, allowing the data to express variable access to tool stone across the site, and production, particularly in terms of prismatic and expedient/flake cores. Variances in prismatic blades are also analyzed, not solely numerically, but also for size, quality of material, and sources the parent stone derives from. These differences serve to highlight the relationship between centralized political institutions and households in Preclassic Mesoamerica.

Bos, Kirsten (University of Tuebingen) and Johannes Krause

(University of Tuebingen)

- [172] *Ancient Pathogen DNA: Protocols, Progress, and Possibilities*
 The demonstration that molecular capture techniques can be successfully applied to ancient pathogen DNA from skeletal tissues opens many doors for infectious disease research. While the methods applied from initial screening to full genome reconstruction are quickly becoming standard in ancient DNA, they are practiced by only a handful of labs worldwide. With this talk I hope to increase the popularity and accessibility of these methods with coherent explanations of the procedures, the requirements, their efficacy, and their suitability for different research questions related to ancient pathogen research. Current progress with ancient pathogen retrieval and analysis will be discussed.

Bosch, Marjolein (MPI-EVA Dept. Human Evolution), Laura Niven (MPI-EVA Dept. Human Evolution), John de Vos (NCB Naturalis) and Jean-Jacques Hublin (MPI-EVA Dept. Human Evolution)

- [68] *New Data on Middle Paleolithic Subsistence Behavior at Ksâr' Akil (Lebanon).*
 Ksâr 'Akil is a key archaeological site in the Near East with a 23 meter sequence covering a long time span from the Middle Paleolithic to the Epi-Paleolithic. Here we present zooarchaeological data on the multilayered Middle Paleolithic deposits. Taking into account the collection bias of these 1930s-1940s excavations toward identifiable remains, the material is clearly anthropogenic in origin as seen by the cutmarks and numerous green break fractures as well as evidence for burning. Generally, carnivores make up only 1 to 2% of the faunal assemblage per layer and carnivore modifications are rare. Therefore, a bias through carnivore ravaging is not likely. Similarly, density mediated destruction did not significantly alter the assemblage. Zooarchaeological analysis of vertebrate remains include: taxonomic evenness, skeletal element frequencies, mortality profiles, etc. At Ksâr' Akil Dama mesopotamica, Bos sp. and Sus scrofa are the most frequent taxa throughout the sequence. Contrary to many other Middle Paleolithic Levantine assemblages, gazelle remains are rare and equids are absent, whereas wild boar is one of the dominating species. The unusual pattern observed at Ksâr' Akil broadens our view of Middle Paleolithic subsistence behavior in the Near East. Funding: Max Planck Society.

(Bostwick, Todd (PaleoWest Archaeology)

- [97] *Hohokam Sunwatching at the Shaw Butte Hilltop Site in Phoenix, Arizona*
 With its broad valleys bordered by steep, narrow mountains, the Sonoran Desert's sweeping landscape of earth and sky lends itself well to the observation of astronomical phenomena. The native peoples of southern Arizona have long watched the patterned movement of several celestial bodies, especially the sun, for timekeeping and have incorporated stories about them into their oral traditions. This paper discusses research conducted at the Shaw Butte Hilltop Site in Phoenix, Arizona, which has documented evidence for the marking of the sun's annual journey through the sky by the prehistoric Hohokam culture. For more than 1000 years, Hohokam farmers employed sophisticated engineering skills in constructing their extensive canal systems. These farmers would have been in tune with the desert's bimodal rainfall pattern and the Salt and Gila River's annual flood cycles, with labor demands and ritual obligations following those natural cycles. It is argued in this paper that the Hohokam tracked the seasons through the observation from hilltop sites of the sun's movement in order to create a calendar that established a framework for organizing seasonal labor demands and ritual obligations.

Boudreaux, Edmond and Kandace Hollenbach (Archaeological Research Laboratory - University of

(Tennessee)

- [54] *Feasting and Early Platform Mound Construction on the Gulf Coast of Mississippi*
 Many early platform mounds (pre-A.D. 700) in the southeastern United States appear to have been places where large groups gathered for the performance of communal rituals. Activities that accompanied these gatherings included the erection of monumental posts, the production and exchange of objects from nonlocal materials, and the manipulation of special objects. Feasting events that involved the large-scale preparation and consumption of food and the consumption of special foods also appear to have been an important part of many of these gatherings at early platform mounds. This paper will report on the investigation of the Jackson Landing site, an earthwork and platform mound site on the northern Gulf of Mexico in coastal Mississippi where feasting was associated with the initiation of mound construction at approximately A.D. 660. Seasonal indicators from plant remains suggest that these events took place in the fall, perhaps as part of regular ritual gatherings that occurred within the space defined by Jackson Landing's earthwork. Feasting events at the site involved the manipulation of special objects and the consumption of special foods, including the earliest evidence for maize in the area.

(Boudreaux, Sarah Nicole (Texas Tech University)

- [213] *Life on the Edge: New Perspectives, Thoughts, and Future Research Ideas on the Ancient Maya Hinterland in Northwestern Belize*
 This paper will provide interpretations of the ancient Maya hinterland by analyzing mapping and artifact data collected within the Dos Hombres to Gran Cacao Archaeology Project (DH2GC) and will present an outline for future investigations. Since the first field season in 2009, research efforts within the DH2GC have uncovered new data that have revealed integral components for understanding the Maya hinterland in a social, economic, and ecological context. Additionally, site planning, settlement patterning, new perspectives about economic drivers, and latest ideas about chronology in the area will be discussed. In the concluding remarks, the paper will outline future investigations within the project in regard to ceramic analysis. By concentrating on craft production/specialization via ceramic manufacture, new data will be derived by focusing on the economic implications and social relations people had with the movement and manufacturing of goods across their environment.

- [213] *Chair*

Boudreaux, Sarah Nicole [213] see Chenault, Nicole

(Bouknight, Aletheia (Washington State University)

- [45] *Analysis of Bird Remains from the Bergen Site (35LK3175), Fort Rock Basin, Oregon*
 Located Oregon's Fort Rock Basin and the Great Basin physiographic province, the Bergen Site (35LK3175) is a middle Holocene site with two houses, each containing a hearth, and one butchering area used for processing animals prior to consumption. Currently, archaeologists argue that the Bergen Site was occupied in the fall and winter. However, by analyzing the avifaunal remains, we can see a systematic acquisition of waterfowl in the fall through early spring, suggesting greater differences in seasonality than previously thought. The migratory patterns of the 25 bird species identified were compared with the ethnographic record of the area. These avifaunal analyses provide additional insights into the use of overwintering base camps in the mid-Holocene occupation of the northern Great Basin by revealing a more significant reliance on birds, a more complete image of the site's seasonality, and a greater appreciation of the site's broader ecological context. This further suggests that avian-focused zooarchaeological analyses can provide unique insights into past behavior and should be utilized more frequently in

zooarchaeological research.

Boulanger, Matthew [62] see Lattanzi, Gregory

Boyce, Joe (School of Geography and Earth Sciences, McMaster University), Peter Dao (School of Geography and Earth Sciences, McMaster U), Despina Koutsoumba (Ephoreia of Enalion Antiquities, Athens, Greece), Eduard Reinhardt (School of Geography and Earth Sciences, McMaster U) and Richard Rothaus (Trefoil Cultural and Environmental Heritage, Sauk)

[83] *Coastal Reconstruction of Submerged Bronze Age Shorelines and Anchorage Sites at Kalamianos (Korpos, Greece)*

Rapid changes in relative sea level (RSL) have dramatically altered the configuration of the Aegean coast since it was first settled by prehistoric peoples. At Kalamianos, a newly discovered Mycenaean settlement on the Saronic Gulf, a RSL rise of 6 m is indicated by submerged architectural features and beachrock (3.5-5.9 m depth) containing Helladic pottery. A detailed underwater geophysical and geomorphic survey was conducted to map the Bronze shoreline position and to identify potential anchorage sites. Beachrock elevations, 14C chronology and micropaleontologic data were used to construct a RSL curve and paleoshoreline maps. During the Early Helladic occupation of the site, the mainland was connected to a small island by a narrow isthmus with a well-sheltered harbor basin on its lee side. During the subsequent Mycenaean phase, sea level rose by about 1.5 m, submerging the promontory. Mycenaean shipping activity is recorded by abundant pottery and wood charcoal fragments (AMS 14C age 1640-1400 cal BC) in beachrock and ballast mounds identified by magnetic gradiometer surveys. No evidence was found for a constructed harbor at Kalamianos but the well-protected natural embayments afforded by coastal headlands would have provided safe anchorages under varying wind and wave conditions.

Boyce, Joseph [162] see Reinhardt, Eduard

Boyd, Charles (Radford University) and Donna Boyd (Radford University)

[153] *The Scales of Archaeological Theory*

As has been the case in cultural anthropology, for decades archaeologists have hotly debated various theories seeking to enhance our interpretation of the past. While in some cases, theoretical approaches are diametrically opposed to one another--such as postmodernist reflexive interpretations and the more scientifically oriented methods of the New Archaeology--others merely reflect a difference in subject matter, context, and research questions and goals. Following ideas espoused by Michael Schiffer, we suggest that theories that may appear incompatible are not, but instead reflect different scales of inquiry. For example, just as one would not use a multivariate statistical technique like factor analysis to analyze a nominal data set, a more individualistic theory, such as agency theory, might better explain the contents of a specific burial than evolutionary theory, which would be more effective in answering large scale questions. This does not mean that agency theory and evolutionary theory are incompatible--each may be appropriate to both the level and nature of inquiry being addressed. In this paper, different scales of anthropological and archaeological theory are described to illustrate their overall compatibility, once their different levels of inquiry are recognized.

Boyd, Donna [153] see Boyd, Charles

Boyd, Matthew, Andrew Lints (Western Heritage), Clarence Surette (Dept. of Anthropology, Lakehead University) and Scott Hamilton (Dept. of Anthropology, Lakehead University)

[258]

Maize Horticulture and the Woodland Tradition in Subarctic North America

Recent archaeological research indicates that maize and other cultigens were consumed by precontact societies in subarctic North America since at least AD 500. It is unclear, however, if domesticated plants were obtained in these northern settings primarily through long-distance trade or local gardening. In this study, we present the first evidence of ancient food production in the North American boreal forest and, by extension, the most northerly example of precontact horticulture in the Americas. Our data consist of plant microfossils (starch granules, phytoliths, and pollen) recovered from archaeological features, grinding stones, and carbonized food residues from a cluster of Middle and Late Woodland sites located approximately 350 km south of the Hudson Bay Lowlands in Northern Ontario, Canada. We argue that food production in this region was embedded in a pre-existing seasonal round centered on the autumn wild rice (*Zizania* sp.) harvest, and necessitated no significant changes in mobility/site permanency, food processing or storage technology, or economic scheduling. As a result, low-level food production may have rapidly spread across the southern boreal forest while leaving behind few archaeological traces of this event. These results indicate that horticulture was far more widespread in North America than archaeologists have previously recognized.

Boyer, Alison (University of Tennessee)

[35] *Holocene Extinctions of Pacific Island Birds: What Was the Role of Humans?*

Avian remains found in archaeological settings have revolutionized our understanding of the ancient birdlife of Pacific islands and the interactions between people and birds throughout the history of human occupation. We now know that extinctions of birds followed human colonization on virtually every inhabited island across the Pacific. What can these extinctions tell us about the human-bird interactions that led to their demise? At least two-thirds of the landbirds on Pacific islands went extinct in the period between first human arrival and European contact, with extinction rates linked to island and species characteristics that increased susceptibility to hunting and habitat destruction. In the Hawaiian Islands, prehistoric extinctions showed a strong bias toward larger body sizes and flightless, ground-nesting species, which points to human hunting as a causal mechanism for their extinction. However, many small, specialized species, mostly granivores and frugivores, also disappeared, implicating a wide suite of human impacts including clearing of dry forests. Extinctions were ecologically selective and the observed patterns point to the importance of different anthropogenic mechanisms. Human foraging and other subsistence activities placed severe ecological constraints on island avifaunas such that large, endemic species with high metabolic and habitat requirements were prone to extinction.

Boytner, Ran (USC)

[209] *The Changing Dynamics of Archaeology Field Schools: Data from the Archaeological Institute of America (AIA), 2008-2012*

The Archaeological Institute of America (AIA) website is a central digital location for archaeologists to publicize their field schools and for students to explore great diversity of offerings. Exploring its database, therefore, provide interesting insights into trends and scale of field school offerings. This paper will examine data from the AIA database dated to 2008-2012. It will present the impact of the 2008 economic crisis on field school offerings, examine shifts in field school costs and evaluate total numbers of students attending archaeology field schools, both domestic and international. Analysis of the AIA database is supported by conjunctures driven from data analysis of the UCLA Field Program (2007-2010) and the Institute for Field Research (2012) where the number of field schools is more limited but data resolution is significantly higher. Using the aggregate of data, this paper will compare results from archaeology field school data with those published by the Institute for International Education which tracks

trends in study abroad programs across the nation and disciplines.

[209] *Chair*

Bracamontes Gutierrez, Juan Jose G.

[107] *The Historical Archeology of the Port of San Blas*

A través del estudio de fuentes históricas y de los artefactos arqueológicos analizaremos la importancia que tuvo el bastión septentrional en la Nueva Galicia del siglo XVIII. Se exponen los antecedentes que impulsaron su instauración como el reformismo Borbón, el fenómeno de piratería en el Pacífico y la ocupación de espacios por compañías comerciales rusas y británicas. Se revisan los patrones de asentamiento de la villa como una forma de replicar los modelos poblacionales hispanos en donde confluyó la sociedad civil, militar y comercial. Los residentes de este ancladero fueron una élite privilegiada, por ello tuvieron inclinación por consumir bienes exóticos como método de distinción social. Dichos materiales identificados en prospecciones de superficie van desde las porcelanas orientales, mayólicas y cerámicas de origen europeo, entre otras. La introducción de estas mercaderías se inserta perfectamente en el desarrollo de la economía mundo capitalista, de esa manera se expondrá brevemente la importancia de la teoría de Wallerstein para explicar los acontecimientos históricos.

Bracewell, Jennifer (McGill University)

[29] *The Infertile Crescent Revisited: A Case (Study) for the History of Archaeology*

This paper examines the history of archaeological research concerning the eastern coast of James Bay in northern Quebec. This area is one of the most remote and heavily forested in Canada. Very little actual fieldwork was undertaken here until rescue excavations in the 1970s. Despite this, the region's prehistory had already been defined by archaeologists: it was thought to have changed very little in subsistence or culture since the area was occupied, as it was part of the "Infertile Crescent" of the Canadian North. The construction of prehistory in northern Quebec began with the earliest contact of Europeans with Native Canadians and has developed from religious explanations to classical evolutionary ones to culture-historical ones to neoevolutionary scientific ones. Although the theoretical interpretations have changed, the content has remained surprisingly constant. The remoteness and size of the Shield, and the challenges of research in the area, led to generalizations that telescoped thousands of years and eight million square miles into a single interpretation, based ultimately on eighteenth- and nineteenth-century assumptions about hunter-gatherers, environmental determinism and race. This paper traces how these assumptions have affected the archaeology of the twentieth century in James Bay and northern Quebec.

Brack, Michael [148] see Sanchez, Ismael

Bracken, Justin (CUNY Graduate Center)

[290] *Late Maya Reconceptualization and Reshaping of the Landscape: Late Postclassic Evidence from the Site of Tayasal on Lake Petén Itzá in Northern Guatemala*

As the last holdout against Spanish conquest and missionization in Mesoamerica, the Petén Lakes region offers a glimpse into the lattermost pre-Colonial Maya activities. Recent work at the site of Tayasal, in and around the San Bernabé Mission there, has provided new insights not only into life in the Mission, but also into the occupation of the area in the times preceding Conquest. With the earliest construction dating to the Late Preclassic, this portion of the site supported waves of occupation through the ensuing

phases of Mesoamerican prehistory and into the Colonial Era. Taking a Dwelling Perspective, this paper investigates the interaction of the Postclassic Maya with the built landscape as a reconceptualization of space, which intertwines their immediate concerns and beliefs with the material remains of the past. It was this negotiation between past and present that laid the groundwork for household-scale routines and rituals during the Postclassic and through to the ethnographically-known era which followed.

Bradley, Bruce [227] see Gurova, Maria

Bradshaw, Elizabeth

[31] *Discussant*

Brady, James (Cal State L.A.)

[109] *A Preliminary Discussion of the Cueva de Rey Condoy Mud Sculptures*

The Cueva de Rey Condoy in the Mixe speaking region of Oaxaca contains an array of iconography, the most spectacular of which are several dozen life-sized, three dimensional mud sculptures. Many of the figures rank among the most sexually explicit in all of Mesoamerican art. Female figures are depicted with bared breasts, spread legs and prominently displayed vulvas. Males are shown as nude with large penises. One sculpture shows a male and female in the act of sexual intercourse. One of the male figures is carried out in Olmec style. Additionally, the corpus includes a number of feline figures and a reptilian figure. The figures are interpreted here as relating to well established Mesoamerica myths of origin and group genesis.

[109] *Chair*

Bragdon, Kathleen (William and Mary)

[223] *The Trope of Conspicuous Consumption in Native Southern New England: Dress and Gendered Performance among 17th Century Ruling Elites*

Several accounts written by seventeenth century English observers of native dress and adornment in southern New England focus on the "finery" that distinguished the native elite, especially elite women. This paper investigates these accounts, examining them from a literary, cultural, and post-colonial perspective. From this, it will be possible to suggest an alternative explanation for gendered performance in the region, one that links material signals to the political, social, and economic realities of the contact era in the Northeast.

Braje, Todd (San Diego State University)

[283] *Humans and the Acceleration of Animal and Plant Extinctions*

One of the more enduring and stirring debates in archaeology has revolved around the role humans have played in the extinction of large terrestrial mammals (megafauna) in Australia and the Americas near the end of the Pleistocene. Rather than seeking a prime driver (e.g., climate change, human hunting, disease, or other causes) for Pleistocene extinctions, we focus on the process of human migrations and technological developments during the last 50,000 years, changes that initiated an essentially continuous cascade of ecological changes and transformations of regional floral and faunal communities. Hunting, the translocation of plants and animals, human landscape modifications, and evolving human subsistence and cultural systems all contributed to a growing human domination of earth's continental and oceanic ecosystems. We explore the deep history of anthropogenic extinctions, trace the accelerating loss of biodiversity around the globe, and argue that Late Pleistocene and Holocene extinctions can be seen as part of a single complex process of extinctions that have been increasingly driven by anthropogenic factors that continue today.

[283] *Chair*

Brandt, Steven [10] see Hildebrand, Elisabeth

Brandt, Steven (University of Florida), Lucas Martindale Johnson (University of Florida) and Arlen Chase (University of Central Florida)

[62] *A Comparative Study of Multiple Bruker Tracer III Calibrated Instruments Using Identical Analytical and Operational Procedures: Implications for Past, Present, and Future Obsidian Studies*

Portable XRF (pXRF) instruments enable archaeologists with little or no training in physics/chemistry to conduct obsidian studies worldwide. The last decade has witnessed a rapid increase in their archaeological use, accompanied by increasing concern over data accuracy and replication. Particularly worrisome is the use of multiple instruments (regardless of make or model) to obtain data from the same or different samples. This arises from the inherent variability of each individual instrument, and absence of standardized obsidian calibration and operational procedures. Recently Bruker AXS began to factory-install in all Tracer Series instruments an obsidian calibration derived from INAA, LA-ICP-MS, and MD-ICP-MS analyses of 40 specific obsidian source samples at MURR (Glascock and Ferguson 2012). A recent University of Georgia study comparing obsidian data generated by a single Tracer III calibrated device against international obsidian standards indicated statistically insignificant variability (Speakman 2012). Here we report on a comparative study of multiple Bruker Tracer III calibrated instruments using identical analytical and operational procedures to analyze two obsidian control sets from: 1) an extensive quarry site in SW Ethiopia; and 2) the Maya site of Caracol in Belize. Implications of our results for future, as well as past pre-Bruker calibration obsidian studies are discussed.

Brannan, Stefan (University of Georgia)

[54] *The Occupational History of Singer-Moye, the Second Largest Mississippian Period Site You've Never Heard of*

Singer-Moye is a large, multi-mound Mississippian site in southwestern Georgia. Previous investigations here concentrated on architectural evidence for mound use on four of the eight mounds. In 2012, The University of Georgia conducted an extensive survey employing shovel testing and shallow geophysical survey, concentrating on non-mound areas. This work helped define the extent of the settlement, identify residential and other activity areas, and contribute to chronological refinement. This paper describes these results and compares the occupational history of Singer-Moye to contemporary sites in the Deep South, including Moundville and Etowah.

[54] *Chair*

Brantingham, P. Jeffrey [291] see Rhode, David

Braswell, Geoffrey (UC San Diego) and Beniamino Volta (UC San Diego)

[256] *Absolute and Relative Time: Understanding the Chronology of Chichen Itza*

The ancient Maya constructed sophisticated and complex calendars that reflected and structured their perceptions of the world. So, too, do archaeologists. Such archaeological chronologies reflect our current interpretations of ancient Maya history, yet often confine or limit new understanding. In the case of Chichen Itza, conflicting chronologies derived from Maya hieroglyphic inscriptions, the books of Chilam Balam, ceramic studies, architectural analysis, and radiocarbon dates have made it difficult to define in absolute time the growth and collapse of the great city. In this presentation, we summarize alternative chronologies of Chichen Itza and attempt to resolve some of the

differences among them using Bayesian statistics in order to better understand the history of the site.

[256] *Discussant*

Braun, David [155] see McPherron, Shannon

Bray, Tamara (Wayne State University)

[132] *Commensal Politics in the Andes: A Comparison of Wari and Inca State Ceramic Assemblages*

This paper examines the political and symbolic implications of culinary assemblages associated with the Andean conquest states of the Wari and Inca. A comparative analysis of the vessel forms and the imagery found on 'state pottery' allows us to more clearly articulate the role of commensality and art in the construction of state authority and strategies of legitimization. While charting the evolution of imperial symbolizing practices in Andes, the study has broader implications for more general theories about the role of ideology in the development of early expansionary states.

[132] *Chair*

Brennan, Candice [186] see Sweeney, Angelina

Brennan, Michael (University of Rhode Island, Graduate School of Oceanography)

[213] *Application of Low-Field Magnetic Susceptibility to Plaster Floors in Excavation Profiles at Maya Sites in the Three Rivers Region, Belize*

The methods for plaster production by the Classic Maya have not been well defined. Environmental degradation during the Classic period has led researchers to consider the amount of wood resources required for the production of the large amounts of plaster used. This study tested the use of low-field magnetic susceptibility to identify plaster floors in excavations at sites in the Three Rivers Region, Belize. The process of burning limestone to make plaster increases the magnetic susceptibility, which is the potential for a material to become magnetized. The data suggest that, in the Three Rivers Region, the Maya stopped burning limestone and only used crushed limestone to make plaster, likely due to deforestation and lack of wood resources. This is an experimental study that may be expanded on a larger regional scale to examine temporal changes in plaster production as evidenced by excavation stratigraphy.

Breternitz, Cory

[123] *A Summary of Data Recovery Investigations in the Vicinity of Tolakai, Navajo-Gallup Water Supply Project, Northwest New Mexico*

PaleoWest Archaeology conducted data recovery investigations at four prehistoric sites along the Navajo-Gallup Water Supply Project (NGWSP) right-of-way north of Gallup, New Mexico. A Basketmaker III site with two large pit structures and over two dozen extramural features, and two Pueblo II surface masonry pueblo sites are discussed. Both of the pueblos have kivas, living rooms, and storage features that were excavated over one meter into bedrock. These Pueblo II habitation sites represent an interesting contrast to the classic Prudden Unit layout that is common during this period. The fourth site is an agricultural locality with a protohistoric terrace that has up to 20 buried juniper trees. An overview of ongoing and upcoming survey, testing, and data recovery work in the NGWSP area is also discussed.

Breunig, Robert and Jim Enote (A:shwi A:wani Museum and Cultural Center, Zuni Pueblo)

[110] *Forming Partnerships with Tribal Communities*

This presentation will focus on how a "mainstream" museum collaborates with tribal communities. We will describe tribal

involvement in the design of the Easton Collection Center at the Museum of Northern Arizona and the program partnership between the Museum of Northern Arizona and the A:shiwi A:wan Museum and Cultural Center at Zuni Pueblo. We will describe collaboration on exhibit planning and implementation, a collections collaborative, and an annual cultural festival. The presentation will discuss a model relationship employing on-going collaboration.

Brewer, Jeffrey (University of Cincinnati) and David Hyde (Western State Colorado University)

[235] *Settlement Pattern Analysis at the Medicinal Trail Community, Northwestern Belize*
 Two years of total station mapping at the Maya hinterland settlement at the Medicinal Trail Community of northwestern Belize has revealed a pattern of settlement selection. The community consists of a wide range of formal courtyard groups, multiple landscape modifications including terraces, depressions, and linear features, and a number of informal mound clusters. Total station mapping has revealed a settlement pattern in which, (a) the largest, and most complex household groups are associated with ridge tops, (b) possible artificial drainages and reservoirs are associated with dense settlement, and (c) numerous terraces are located on the slopes of the ridges, near some of the drainage features.

Brewington, Seth [273] see Nelson, Margaret

Brewington, Seth (City University of New York, The Graduate Center)

[273] *The Social Costs of Sustainability in the Faroe Islands*
 Though the development of sustainable, resilient societies is generally viewed as a successful and desirable outcome, the maintenance of such systems inevitably involves trade-offs, the costs of which are often not carried equally by all segments of society. In this paper I examine several dimensions of human security in the Faroe Islands, a small archipelago in the North Atlantic. Despite a marginal climate and paucity of arable land, the agro-pastoralist settlers of the Faroes were able to develop a resilient society through a combination of factors, including heavy exploitation of "pseudo-infinite" wild resources and the establishment of self-regulating communal institutions and strong social cohesion. The 12th and 13th centuries CE, however, brought significant social, economic, and environmental challenges, several of which represented real threats to the integrity of the sustainable system of land- and resource-use. Though sustainability of the resource base was ultimately maintained, this appears to have been achieved in large part through measures that disproportionately impacted a significant portion of Faroese society.

Bria, Rebecca [57] see Sharp, Emily

Bria, Rebecca (Vanderbilt University) and Barylski Tamara (PIARA)

[235] *Transforming Tradition: The Emergence of the Huarás Culture at the Ceremonial Center of Hualcayán, North-Central Highlands of Peru*
 After the breakdown of the widespread Chavín religious tradition at the end of the Formative Period (500-200 B.C.), new social patterns, political configurations and religious practices emerged with the development of the Recuay culture (A.D. 1-600) in the north-central Peruvian highlands. The transitional culture that links these developments, the Huarás, has received surprisingly little archaeological attention, leaving the transformational processes of culture change elusive for this period. Furthermore, much of what we know about Huarás comes from tombs, surface scatters, or the influential religious center of Chavín de Huántar. Yet Huarás practices at Chavín may not be representative of the social developments seen at smaller community centers that had less at

stake in rejecting Chavín beliefs and values. Thus, data from the ceremonial center of Hualcayán in the Callejón de Huaylas valley gives us one of the first detailed studies of Huarás outside of Chavín, demonstrating how the Huarás locally redefined their religious spaces and practices during this tremendously transformative period. This poster presents a detailed material analysis of Huarás ceramics from Hualcayán, highlighting how they were used in ritual feasting events in modified architectural spaces on a ceremonial mound structure previously used for Formative ritual activities.

Briceño, Jesús [70] see Bardolph, Dana

Briceño Rosario, Jesus [165] see Billman, Brian

Brickley, Megan [42] see Lockau, Laura

Brill, James

[177] *Violent Adaptations: Technology of Violence and Cultural Evolution along the Santa Barbara Channel*

This study attempts to link environmental change and increases in violence along the Santa Barbara Channel in the Late Middle period through changes in technology. This study combines models of technological investment with studies of artifact standardization to determine if the prehistoric Chumash used violence as an adaptive response. This study expands on the theories of technological investment, hypothesizing that an investment in the technologies used in violence were used as a means of cultural adaptation. From the collection of the Santa Barbara Museum of Natural History projectiles points, spears, and pestles were analyzed to determine if the tools used in violence in general, and during times of increased violence, showed reduced variation through time. Changes in artifact variability were accessed using the Coefficient of Variation (CV), which was used to compare the degree of variation in tools used in violence to those unrelated to violence across geography, association, and time. The time periods compared in this study was the Late Early Period to the Late Period (6630 BC- AD 1804). It was hypothesized that artifacts used in violence would have a lower CV% in general, and a lower CV% during times of increased violence, indicating specialization.

Britton, Kate [20] see McManus, Ellen

Britton, Kate (University of Aberdeen), Rick Knecht (University of Aberdeen), Ellen McManus (University of Aberdeen) and Mike Richards (University of British Columbia)

[138] *Maritime Adaptations and Dietary Variation in Prehistoric Western Alaska: Stable Isotope Analysis of Permafrost-Preserved Human Hair*

The reconstruction of diet and subsistence strategies is integral to understanding early human colorizations and cultural adaptations, especially in the Arctic - one of the last areas of North America to be permanently inhabited. However, evidence for early subsistence practices in Western Alaska varies, particularly with regards to the emergence, importance and intensity of sea mammal hunting. Here we present stable carbon and nitrogen isotope data from permafrost-preserved human hair from two new prehistoric sites in Western Alaska, providing a direct measure of diet. The isotope evidence indicates a heavy reliance on sea mammal protein amongst the earlier Norton-period group (1750±40 cal BP). In contrast, analysis of the more recent Thule-period hair samples (650±40 cal BP; 570±30 cal BP) reveals a more mixed diet, including terrestrial animal protein. These analyses provide direct evidence for dietary differences amongst Alaska's early Eskimo groups and confirm the antiquity of

specialized sea mammal hunting and procurement technologies. The results of this study have implications for our understanding of human adaptation to maritime and high latitude environments, and the geographical and temporal complexity in early Arctic subsistence.

Britton, Emma

- [267] *Preliminary Analysis of Black Pigment Recipes on Casas Grandes Polychromes*

Field observations regarding the varying textures of black paint on Casas Grandes polychromes from Site 204 (Upper Tinaja), located in Chihuahua, Mexico, ranged from matte, sugary, to true-glaze-paint, indicating that there were likely multiple pigment recipes utilized to decorate ceramics at this site. However, these visual manifestations of possible paint recipes did not necessarily correspond to specific ceramic formal types, nor paste-temper recipes. Continuing laboratory investigations, using portable X-ray Fluorescence, have suggested, based on presence-absence of different elements, that up to seven distinct elemental recipes may have been utilized, through time, on many different ceramic formal types, at Site 204. These elements do not necessarily co-occur geologically, which suggests that multiple pigment rocks were mixed together, intentionally, in order to create the same, or similar, black pigment manifestations. This poster investigates possible motives for these varying recipes, ranging from functional to cosmological.

Broda, Johanna (UNAM, MEXICO)

- [166] *The Comparative Study of Indigenous Calendar Festivals and Astronomical Dates: Mesoamerica and the Andes*

In Mesoamérica, the dates of February 12, April 30, August 13 and October 30 are particularly important in the annual cycle of Calendar Festivals being closely related to agricultural activities and the seasonal cycle. These dates were already significant in Prehispanic times since they are reflected in the orientation of archaeological sites and individual buildings by an acutum of 105.5° towards sunrise and 285.5° towards sunset. Among other sites, this orientation exists at Teotihuacan. In this paper, I compare my research of ethnohistorical and ethnographic data from Central Mexico with some consideration of the significance of precisely these dates for the Quechuas of the Southern Andes, particularly the region of Cuzco and Lake Titicaca. The comparative study of the Aztecs and the Incas, which has also been a field of research of Anthony Aveni over the years, may contribute to gain a broader understanding of Native American calendrics and astronomy.

Brokaw, Nicholas [213] see Beach, Timothy

Broodbank, Cyprian

- [167] *Did Islands Make Much Difference to World Prehistory? Perspectives from the Mediterranean*

Island archaeology is a well-established field, but in an age of competing demands on archaeological and wider resources, it is timely to ask what it does for overall understanding of prehistory and the shape of the world we live in. Three answers spring to mind. One is that it offers our best route into the deeper past of island societies, and this is certainly a substantial good within its own terms of reference, not least as such societies today are among the most threatened on the planet. Second, it is claimed that island research contributes to the comparative study of broader social process; the applied truth of this appears less demonstrable, and thinly evidenced. The third is that intervening islands and islanders had a significant impact on what went on in the continental world around them. Intriguingly, this is often questionable; how often prior to the recent expansion of global navigation did it make much surrounding difference if an archipelago lay empty or was peopled? For a variety of partly configurational reasons, the Mediterranean theatre offers an

exception in this respect, and this papers highlights key junctures at which the presence of islands clearly shaped overall Mediterranean prehistory.

Brook, George [28] see Franco, Nora

- Brooks, Alison (George Washington University), Richard Potts (Human Origins Program, NMNH, Smithsonian Institution), Matthew W. Tocheri (Human Origins Program, NMNH, Smithsonian Institution) and Christian A. Tryon (New York University/ HOP, NMNH, Smithsonian Institution)**

- [10] *Coding the Paleolithic of East Africa: Problems, Possibilities, and Procedures*

Since 2002, the Smithsonian's Human Origins Program has developed a database relevant to human evolution from published localities, searchable by location, by time range and by data category: Archaeology, Hominins, Fauna, Chronology, Environment and Stratigraphic Context. Data involving artifacts are most problematic, due to a lack of standardization, both in the archaeologists' categories and in the shaping, reshaping and/or use of artifacts by their ancient makers. The current HOP-DB includes 739 unique published terms to describe artifacts from 471 EastAfrican sites. Archaeological taxonomies are developed not to reflect underlying biological or geological processes, but to answer questions about past behavior. These taxonomies may reflect past cognitive and technological abilities, intentions, raw materials, use history, cultural practices and other factors. To improve the utility of this and/or other databases we suggest a three-stage process: 1) ascertain what questions the archaeological community is asking about past behavior and what categories of material culture appear to be most useful, most discussed, most agreed on and/or most problematic; 2) refining questions and relevant categories that appear to be the most useful and commonly held; and 3) apply these categories to the raw data in the HOP-DB or other databases to test specific hypotheses.

- [248] *Discussant*

Brooks, Alison S. [11] see Ranhorn, Kathryn

Brotherson, David [7] see Chhay, Rachna

Brotherson, David (University of Sydney)

- [104] *The Fortification of Angkor Wat*

The enclosure wall of Angkor Wat features several thousand regularly spaced postholes. The postholes are located around the entire perimeter and are of two types: horizontal holes situated along the upper edge of the inside face, and vertical holes along the top. This research presents the postholes' first systematic survey and study. The results of the survey demonstrate a high degree of standardization in the size and shape of the postholes. The spatial distribution of the postholes is consistent over a considerable distance. The relationship between the postholes and the construction phases of the wall allows a relative chronology to be established. The outcome of this analysis shows that the postholes supported a defensive structure and are consistent with the traces of a wooden platform and palisade. The date of the installation of these defensive works is as yet unknown, however the likely historical context is sometime from the 1590s until the 1630s CE.

Broughton, Jack M. [71] see Beck, R

Brown, Linda (The George Washington University)

- [14] *Personhood, Nawales, and Sacred Objects: A Case Study from the Contemporary Tz'utujil Maya Area*

From a relational perspective, personhood is not an a priori state of being but a status afforded to certain plants, animals, and things who, in some important ways, "act like persons" in social relationships with others. In this paper, I explore relational personhood through the sacred materials used by contemporary Maya ritual practitioners. In the highlands of Guatemala, Tz'utujil ritual practitioners collect and curate certain types of materials, including antiquities, as sacred objects. Carefully stored on altars and in personal sacred bundles, these items are considered animate objects embodied by a class of potent beings known locally as nawales. Nawales are multifaceted beings - culture heroes, ancestors, earth deities, and santos, among others - who come from an era prior to the creation of our present sun. Curated sacra display a significant aspect of personhood, as they engage in reciprocal exchange. They provide the fertility of humans, forests and fields, and actively mentor and communicate with their human caretakers in dreams. In return, ritual practitioners provide nawales with fire (food, drink, warmth), as there is none in their world. Through daily ritual practices with these powerful embodied objects, ritual practitioners bring renewed meaning to the deep past in the present.

Brown, Sarah (University of California, Davis), Christyann Darwent (University of California,Davis) and Ben Sacks (University of California, Davis)

[20] *Ancient DNA Analysis of Dog Remains from the North American Arctic*

The Thule people are known for their innovation and rapid colonization of the North American Arctic, ca. 1000 years ago. A distinguishing characteristic of Thule culture relative to previous Arctic cultures was increased use of dogs, particularly for dog-sled traction. Use of dogs by the Thule is reflected in the archaeological record by a dramatic increase in dog remains in zooarchaeological assemblages. Here, we present results from an Arctic wide survey and analysis of the temporal and spatial distribution of dog remains and their genetic characteristics. We compare diversity of the D-loop region of the mitochondrial DNA in Thule and Paleoeskimo dogs from Alaska (Interior as well as Coastal), Canada, Greenland, and Paleoeskimo dogs from Chukotka, Siberia to assess origins, interchange, and changes through time

Brown, M. Kathryn [48] see Hard, Robert

Brown, Emma, Ben Stern (Archaeological Sciences, University of Bradford), Arthur Aufderheide (Emeritus, University of Minnesota at Duluth) and Andrew Wilson (Archaeological Sciences, University of Bradford)

[50] *Chemical Evidence for Snuffing Practices in the Azapa Valley, Northern Chile, during the Late Intermediate Period*

Snuff trays and tubes for inhaling psychoactive snuff are well documented in archaeological contexts from northern Chile. Chemical analyses of suspected snuff samples from archaeological contexts confirm that alkaloids capable of producing visual hallucinations were present in snuff, yet direct evidence for inhalation of snuff by ancient Andean populations is lacking.

Based on prior successful analyses of ancient hair for coca metabolites, a total of 46 hair samples from individuals associated with the Cabuza culture, dating to the Late Intermediate Period, were tested for a number of psychoactive compounds using liquid chromatography tandem mass spectrometry (LC-MS/MS).

Two individuals, an adult male aged around 35 identified as an Orejon, and a young adult female had traces of bufotenine in their hair. Bufotenine is the main alkaloid in Anadenanthera, a species of tree of which the bark and seeds have been used to make a psychoactive snuff.

These results are the first report of bufotenine being detected in ancient hair samples. The results are discussed within the wider archaeological and bio-cultural context.

Brown, David (University of Texas at Austin), Mark Willis (Blanton & Associates) and Chester Walker (Archaeo-Geophysical Associates, LLC)

[125] *Mapping the End of Empire: Low Level Aerial Reconnaissance in Western Cotopaxi Province, Ecuador*

Much has been written about the ethnohistoric details concerning the fall of the Inka empire, but less investigation has been directed at the relevant archaeological remains. Several northern Ecuadorian sites likely played a role in that collapse and may offer new archaeological details. Recent low level aerials of Inka sites in the western Cotopaxi area suggest the construction of new fortifications and enhancement of existing ones. While some of these fortifications seem to have been built to deter attacks from the west, other features suggest a concern with attacks from the east, potentially defending the area against attacks from Quito.

Brown, Kaitlin (California State University, Los Angeles), Jacques Connan (Laboratoire de Biogéochimie Moléculaire), René Vellanoweth (California State University, Los Angeles), Nicholas Poister (California State University, Los Angeles) and Amira Ainis (California State University, Los Angeles)

[125] *Analyses of Asphaltic Mixtures from the California Channel Islands: Evidence for Indigenous Sources of Bitumen in Relation to Submarine Seeps*

Asphaltum, a naturally occurring petroleum product, was used for thousands of years by native Californians as an adhesive and waterproofing agent. While asphaltum originating in submarine seeps often washes up on beaches, ethnohistoric sources state that exclusively high-grade bitumen from terrestrial seeps was used in the construction of plank-canoe. Although there are no terrestrial seeps on the Channel Islands, asphaltum from submarine seeps is carried by prevailing currents and washes up on shore. In this study, we use gas chromatography-mass spectrometry (GC-MS) and carbon isotope data to chemically characterize asphaltum samples from Channel Island archaeological sites and compare them with modern seeps and tar balls in Southern California. Using evidence from multicomponent sites on San Miguel Island and San Nicolas Island, we source asphaltum to determine if it was gathered locally or traded in. Our results indicate that asphaltum was picked up from the island's shores, calling into question the exclusive role of high-grade asphaltum from terrestrial seeps.

Brown, Kevin

[139] *The Design and Visibility of Navajo Culture: The Material Expression of Navajo Ideology, Functionality, and Identity.*

Navajo pottery is among the least understood of ceramic technologies in the American Southwest. This research explores ceramics made from the Dinétah Phase (A.D. 1450-1550) in the San Juan Region of northern New Mexico to the start of the Reservation period in 1868. This research examines the functional role of Navajo pottery within the universe of the Navajo people using a technological style approach that focuses particularly on artifact design and attribute visibility. The aim was to identify the formal attributes of Navajo pottery and explore potential functional meanings. Using whole vessels in museum collections, the study recorded attributes that were arranged hierarchically according to certain fundamental characteristics or dimensions of their variation. Since ceramics reflect technological choices in fired clay, Navajo pottery is a suitable object to investigate such technological, ecological, and cultural processes in Navajo society.

Brown, M. Kathryn (The University of Texas at San Antonio)

[171] *Middle Preclassic Ritual: A View from the Belize River Valley*

Our understanding of the Middle Preclassic time period in the Belize River Valley has greatly increased over the past two decades. Recent research in the Belize River Valley has shed light on early settlement patterns, domestic and public architecture, as well as early ritual practices. Several types of architectural features appear to be common at a number of Middle Preclassic sites. Domestic buildings are most often low, apsidal shaped platforms and are commonly associated with chultuns and midden deposits. Public buildings appear to be more variable with several types encountered to date. These include large, rectangular shaped platforms, circular and key-hole shaped platforms, as well as two-tiered pyramidal structures. The architectural complexes referred to as "E-Groups" begin during this dynamic period and appear to function as ceremonial places on the landscape. This paper examines the evidence for ritual activity associated with both domestic and public Middle Preclassic architecture and discusses broad patterns of continuity and discontinuity seen from the data.

Browne Ribeiro, Anna [60] see Machicado, Eduardo

Browne Ribeiro, Anna (The Ohio State University)

[195] *From Abstract Structures to Navigable Spaces: Reconsidering the Use of Pacific Ethnographies in Amazonian Archaeology*

Neo-evolutionist models of social formation relied heavily on data from Pacific ethnographies for defining particular levels of social integration. This paper examines the impact of these models, and of specific socio-structural forms observed in Pacific Island societies, on the development of archaeological research in Amazonia. The question of the existence of complex societies, and especially chiefdoms in Amazonia, was central in defining Amazonia as a cultural area, and has remained a focal point of ongoing debates. Definitions of chiefdoms, or stratified/redistributional societies, were distilled almost exclusively from data from the Pacific; key authors that defined and refined these models (e.g. Carneiro, Fried, Service) are cited in Amazonianist archaeological literature, wherein neo-evolutionism serves as a framing mechanism and interpretive lens for archaeological work. Though the direct link to these theorists has sunk beneath the surface, Amazonian archaeology remains largely beholden to these models and responsible to narratives created within a neo-evolutionist framing. I briefly consider the impact of this directed approach on the development of both Amazonian and Pacific archaeologies, especially in light of debates on appropriate uses of ethnographies, then propose alternative dimensions along which comparisons between pre-Contact cultures of Amazonia and the Pacific may be productively developed.

[60] *Chair*

Brownlee, Sarah (Yale Peabody Museum of Natural History), Gary Aronsen (Yale University) and Ana Marichal (Yale University)

[260] *Osteology of the Yale-New Haven Four: Inventory and Assessment*

In July 2011, construction at Connecticut's Yale-New Haven Hospital was interrupted by the discovery of human skeletons. The remains were exposed via trench excavation, and lay under a large concrete foundation slab poured in the 1970s. Review of historical records and maps indicate that these remains are from a cemetery associated with New Haven's first Roman Catholic Church established in 1830 and evacuated after a fire in 1848. Four adult human skeletons were recovered, and a few associated artifacts were found. Many of the skeletal elements have some postmortem damage, but overall the remains are remarkably well-preserved. Two of the skeletons are female, one aged 25-35 years, and the other possibly 60-70. The other two are male, one also 25-35, and the other over 60. Both younger individuals have remarkably complete and unworn dentition, while both older individuals show antemortem tooth loss and extreme dental wear.

Here, we present data on the preliminary inventory and assessment of the skeletal remains, including age, sex, stature, and other descriptive physical characteristics.

Brownlee, Sarah [260] see Aronsen, Gary

Brughmans, Tom [23] see Romanowska, Iza

Brughmans, Tom (Archaeological Computing Research Group, University of Southampton)

[106] *Just Points and Lines? Exploratory Network Analysis from a Roman Archaeology Perspective*

Many archaeological applications of formal network techniques consist of an exploration of empirically attested archaeological entities linked by relationships (of whatever nature the researcher considers meaningful). Among the most common issues with these exploratory approaches are how different data types can be used to create networks or validate hypothetical relational processes and how long-term change in connectivity can be explored. This paper will discuss these issues from a Roman archaeology perspective through a case study on urban connectivity in Roman Southern Spain.

Traditional approaches to the archaeology of Roman southern Spain have neglected the study of inter-urban connections. Iron Age (ca. 5th century B.C. to 3rd century B.C.) and Roman (ca. 3rd century B.C. to 5th century A.D.) sites as well as different archaeological data types are often studied independently, which is necessary for a critical understanding of these different sources. However, all these sources were also once part of a single long-term cultural process. A multi-scalar exploratory network method is introduced that aims to explore aspects of the changing interactions between 190 sites dated to a range of ten centuries as evidenced through ten archaeological data types. In doing this the potential and limitations of such an approach will be critically evaluated.

[161] *Discussant*

[106] *Chair*

Brunal-Perry, Omaira

[95] *The Early European Exploration in the Marianas*

Spanish and Portuguese exploration the late 15th and early 16th was an effort on finding a westward route to and laying claim to the Indies—islands known for their rich spices. Their voyages resulted in European sailing vessels first exploring the islands in Micronesia. When Ferdinand Magellan arrived in the Mariana Islands on March 6, 1521 while seeking this westward route to the spice rich Indies, it heralded the beginning of European dominance in Micronesia that would span more than four centuries. Continuous European contact began with Spanish control of the Mariana Islands in 1565.

European sailing vessels exploring and exploiting Micronesia reflect the changing requirements of discovery, conquest, commercialization and colonization. The influence and impact of Europeans on the indigenous people of the islands was widespread. One of the direct results was the eventual disappearance of many of the indigenous craft of Micronesia that were essential to their island life for the mobility, inter-island communication and resource exploitation that reflected and adaptation over the centuries to the forces of nature.

Brundiers , Katja [273] see Swantek, Laura

Bruning, Susan (Southern Methodist University)

[282] *Discussant*

Bruno, Maria (Dickinson College)

[60] *The Place of Maize and Manioc in Prehistoric Agricultural Intensification in the Amazon Basin: An Archaeobotanical Perspective*

It is now widely accepted that prehistoric farmers across the Amazon Basin found novel ways to increase plant food production despite the relatively poor soils that they inhabited. Currently, archaeologists are employing a range of analytical techniques to understand the similarities and differences in agricultural intensification strategies across the sub-regions of the basin. In this paper, I examine the debates surrounding the relative importance of manioc and maize in agricultural intensification, an issue that traverses the region. While ethnohistoric and ethnographic data suggest that manioc was a principal player, the archaeological record presents little direct evidence for it. Based on both archaeobotanical remains and human isotopic data, Anna Roosevelt argued that maize played a more important role than manioc in the process of intensification at Parmana, Venezuela. Here, I consider both arguments in the light of recent archaeobotanical studies at the monumental mound site of Loma Salvatierra, Bolivia. While our data suggest that maize was more prevalent than manioc, is this a model that can be applied across the basin? Moreover, what biases in the use and preservation of these species make it difficult to truly unravel the role that each of these crops played in ancient Amazonian food production.

Brunswig, Robert [75] see Montgomery, Christine

Brunswig, Robert (University of No Colorado)

[75] *Mountain Ute and Earliest Numic Colonization of the Southern Rocky Mountains: A New Perspective from the Sue Site, North Park, Colorado*

From 2007 to 2010, University of Northern Colorado excavations at the Sue Site (5JA421), Ballinger Draw, North Park, Colorado, produced evidence of stratified prehistoric Ute hunter-gatherer camp occupations dating from ca. AD 1100 to AD 1400. Eighteen AMS radiocarbon dates from charcoal, pottery residue, and bone samples were stratigraphically consistent. Agreement of bone dates with wood charcoal dates precluded the possibility of an "old wood" dating problem. The site's chronology is earliest in North Central Colorado's Rockies and as early as more westerly Colorado Plateau and eastern Great Basin regions. Faunal material showed procurement and processing of bison, pronghorn, bighorn sheep, deer, elk, fish, and moose. Fetal bison bone and grass seed and berry pottery residue documented late spring and fall hunting and game processing. Obsidian and other lithic tool source analyses showed contact with contemporary Numic and non-Numic territories in Yellowstone (Wyoming), Colorado Plateau (western Utah and Colorado), Wyoming Basin, Middle Rocky Mountains (Idaho), and Southern Rocky Mountains (north central Colorado and northern New Mexico).

[75] *Chair*

Bryant, Hamilton [6] see Lobiondo, Matthew

Bryant, Jeff

[213] *Soil Conservation and Capital: Building Testable Methods for Measuring Social Stratification in Soil Chemistry*

This paper provides initial insight into the cultural soilscape at the Dos Hombres to Gran Cacao Archaeology Project. The soil on the project area was collected and tested for a range of chemical signatures associated with behavior and to investigate new signatures that have the potential to measure the level of investment in soil management. A chemical imbalance contributing

to P-fixation was identified which may have reduced crop yields in urban areas. Sulfur (S) was identified as a possible proxy for measuring the use of gypsum as a soil amenity. Analyzing soil chemistry, conservation infrastructure and applying folk soil taxonomy at elite and commoner sites may provide a testable means by which develop a better understanding of social stratification in the complex dialectic between the Maya and their soil.

Bryce, Byl [39] see Whittaker, John

Brzezinski, Jeffrey [63] see Butler, Michelle

Brzezinski, Jeffrey (University of Colorado at Boulder), Arthur Joyce (University of Colorado at Boulder), Sarah Barber (University of Central Florida) and Carlo Lucido (University of Central Florida)

[145] *Political Centralization and Ceramic Iconography in the Lower Rio Verde Valley*
Research regarding the emergence of political centralization in precolumbian Oaxaca has typically focused on tombs, monumental buildings, and prestige goods obtained through long-distance trade. However, ceramic analysis can also inform our understanding of inequality based on materials used in everyday life. Through an analysis of iconographic pottery found at sites throughout Oaxaca's lower Río Verde Valley, this study explores the Terminal Formative period (150 B.C. – A.D. 250) development of a centralized polity with its political seat at the site of Río Viejo. During the Miniyua phase (150 B.C. – A.D. 100), potters adorned gray ware serving vessels with abstract decorations. By the Chacahua phase (A.D. 100 – 250), ceramic iconography became more intricate, depicting common Formative-period Mesoamerican themes such as depictions of maize and climatic phenomena. We argue that the increase in complex icons during the Chacahua phase provides evidence of an attempt by elites at Río Viejo to promote a set of regionally shared religious principles that supported political centralization.

Buchanan, Briggs [158] see Scholnick, Jonathan

Buchanan, Briggs (Simon Fraser University), Mark Collard (Simon Fraser University) and Michael O'Brien (University of Missouri)

[220] *Spatial Variation in the Shape of Clovis Points: A Geometric Morphometric Approach*
Clovis points have been found throughout the contiguous United States, southern Canada, and northern Mexico. Geographic variation in the shape of Clovis points has long interested Paleoindian archaeologists. One hypothesis contends that Clovis points varied little across North America. Another argues that variation in Clovis point shape is correlated with distance as a consequence of cultural diffusion. A third hypothesis avers that Clovis point shape is dependent on local environmental conditions. Here, we report a study in which we sought to shed light on these hypotheses with geometric morphometric techniques and a sample of Clovis points from several regions of North America. Having acquired, processed, and extracted shape variables from our sample of points, we used discriminant function analysis to examine whether there are significant shape differences among points from different regions, and matrix correlation analysis to evaluate the relationship between distance and point shape. The matrix correlation analysis revealed no relationship between geographic distance and point shape. In contrast, the discriminant function analysis indicated that there are regional differences in the shape of Clovis points. Follow-up analyses indicated that these differences are better explained by the repeated operation of the founder effect than by adaptation to local environmental conditions.

[220] Chair

Buck, Brandon (Radford University)

[149] *Geochemical Analysis of Unfired and Fired Clay Collected from Virginia River Drainages*
This pilot study is focused on the possibilities of sourcing clay from Virginia river drainages using a Niton XL3T600 series portable x-ray fluorescence device (XRF). Clay samples collected from the four river drainages in Virginia will be geochemically tested to find any chemical variation. The first test will be on unfired samples collected from these areas. The second test will be performed on fired samples. These samples will be fired using traditional methods used by Native Americans in the Southeast. The final test will be conducted on ceramics recovered from Native American sites in the Southeast. The three categories tested will be compared using statistical methods. This comparison will show the possibilities of sourcing clay and using x-ray fluorescence to answer archaeological questions.

Buck, Paul (Nevada State College/Desert Research Institute) and Donald Sabol (Desert Research Institute)

[206] *Remote Sensing for Detection of Prehistoric Landscape Use in NW Arizona, USA*
Optimal maize field locations possibly used by prehistoric agriculturalists in the Mt. Trumbull portion of the Colorado Plateau in NW AZ were modeled using remotely sensed data and ground based observations. We constructed "restrictive" (or classification) models and "fuzzy logic" (or grouping) optimality models. There is a clear preference for larger multi-room sites to be found closer to optimal areas. The smaller one room structural sites are not located closer to the most optimal places as might be expected if they are in fact "field houses". Smaller sites may have been established near optimal field locations only after ~ AD 800, by which time the larger C and L-shaped pueblos had already been established near the most optimal field locations. As this portion of the Mt Trumbull area got increasingly "packed" during the later periods, it may be that kin groups from the larger residential sites established field houses to monitor their more marginal fields. This process might have intensified in the 12th and 13th centuries as environmental conditions deteriorated, or at any time when summer monsoonal rains needed for successful agriculture became reduced for long periods.

Buckley, Hallie [27] see Pietruszewsky, Michael

Buckley, Hallie (University of Otago), Jean Christophe Galipaud (Research Institute for Development (IRD)), Truman Simanjuntak (National Research and Development Center for Archaeology), Sian Halcrow (University of Otago) and Rebecca Kinaston (University of Otago)

[219] *The Possible Influences of Ecology in Island SEAsia and Oceania on Human Health during Austronesian Settlement*

The expansion of Austronesian speaking peoples from mainland Asia into Island South East Asia (ISEA) and Oceania marked the last great migration of humans. These people brought a new language, new crafts and techniques and different food production systems. In Oceania, this Austronesian migration is called "Lapita," visible archaeologically by finely decorated dentate stamped pottery found in their settlements, and more recently cemeteries. The advent of agriculture based food production increased population growth significantly in other regions of the world, known as the Neolithic Demographic Transition but also adversely affected health. The extent to which initial Austronesian settlers relied on agriculture is not clearly understood in ISEA or Oceania, but a departure from rice-based subsistence to fruits, tubers and marine resources by Austronesians in ISEA is well documented. The success of these migration events attests to a mode of adaptive subsistence in areas with relatively poor environments of ISEA and is a precursor for later adaptations in Oceania. The scale of migration and how this influenced diet and health are

questions that can be directly addressed through the combined techniques of bioarchaeology and isotope analysis. The observations from recent research in ISEA and Oceania will be discussed in this context.

Buckmaster, Marla [119] see Anderton, John

Budar, Lourdes (Facultad de Antropología de la Universidad Veracruzana)

[275] *Qué tenemos, qué sabemos: investigaciones arqueológicas en el corredor costero de la sierra de Santa Marta en Los Tuxtlas, Veracruz*
La Sierra de Santa Marta es una cadena montañosa ubicada en la región de Los Tuxtlas al sur del Edo. de Veracruz en México. Las crestas, barrancas radiales profundas y mesetas naturales de este macizo rocoso, forman una cortina natural que va desde la laguna de Sontecomapan hasta la punta El Campanario, restringiendo el acceso a un corredor angosto localizado en la depresión que se forma entre los volcanes de Santa Marta y San Martín Pajapan haciendo de la zona costera un bastión natural que protege un área rica en recursos naturales. La escasez de trabajos arqueológicos sistemáticos en esta subregión de la porción oriental de Los Tuxtlas, representa un "vacío" en la historia regional. Sin embargo, a través de estudios recientes, se han podido identificar una serie de asentamientos arqueológicos con patrones y características muy particulares. Este trabajo pretende aportar datos de los asentamientos de ésta zona costera que contribuyan a la formulación de nuevas preguntas generales para la construcción del conocimiento y comprensión de Los Tuxtlas en época prehispánica.

Bueno, Lucas (Universidade Federal de Santa Catarina)

[26] *Peopling the Eastern South America: Occupying the Landscape and Constructing Territories in Central Brazilian Plateau during Pleistocene/Holocene Transition*

New evidence from well documented contexts from Central Brazilian Plateau (CBP) have shown ancient archaeological sites with dates from the 12th millennium BP, slightly older than the northern and the southern parts of the country, and much older than most Atlantic coastal occupation. The central hypothesis for this presentation is that the very extensive rivers that cross-cut CBP and their forested valley terraces have acted as axial corridors for human penetration during the late Pleistocene times, allowing the peopling of southeast, central and northeast Brazil. In this paper the São Francisco River basin has been chosen as a case study, in order to explore the hypothesis that this river has performed a major role in human dispersion through the eastern portion of the vast Central Brazilian Plateau, a process that could be related to major climatic changes that occurred between the end of the Pleistocene and beginning of the Holocene. Based on theoretical models of human dispersal, the option for a dispersal movement based on a river system creates some expectations regarding site locations and assemblage composition. In this paper this pattern is suggested against the available archaeological context of this region between the 12th and 10th millennia.

Buffington, Abigail

[201] *Patterns of Plant Exploitation of an Iron Age Town: The Macrobotanical Remains of Khirbat al-Mudayna, Wadi ath-Thamad, Jordan*

Central Jordan in the Iron IIB is an archaeological period that has not been explored in depth by paleoethnobotanists, despite its long history of interest to archaeologists and philologists. Considering the historical events surrounding this region in this period, evidence of this type possesses a great potential for assessing the impact of the growing political and social developments on the subsistence and resource strategies as well as environmental impacts of these changes visible at the site level. This study has attempted to address how these larger regional

processes could have potentially affected plant use in this period. The site of Khirbat al-Mudayna on the Wadi ath-Thamad, a fortified site featuring a potential of three phases in in this period, offers an opportunity to address this gap in knowledge. The site, along with the surrounding survey area of contemporary fortified settlements, has been excavated since 1996 by the Wadi ath-Thamad Project and this study has addressed the analysis of light flotation samples collected from the 2001 season to the 2012 season from a variety of contexts.

Buhay, Bill (University of Winnipeg), Yadira Chinique de Armas (Faculty of Biology, University of Havana), Roberto Rodriguez (Faculty of Biology, University of Havana), David Smith (Department of Anthropology, University of Toronto) and Mirjana Roksandic (Department of Anthropology, University of Winnipeg)

[254] *Food Producers or Gatherers: Bioarchaeological and Geochemical Evidence of Cultivation at Canimar Abajo, Cuba*

New stable isotope (carbon and nitrogen) and trace element (Sr, Ca, Cu, Zn, Br) evidence from human bone remains recovered from the archeological site at Canimar Abajo (Matanzas, Cuba) helps dispel the traditional notion that these pre-Columbian people were exclusively hunter-fisher-gathers. Maize, bean and sweet potato starches recovered from the dental calculus of some individuals buried in the both the early (~1000 BCE) and younger (~500 CE) cemeteries compliment the geochemical evidence thereby supporting the idea of a much earlier introduction of cultigens to Cuba than originally thought.

Buikstra, Jane (Arizona State University)

[209] *Discussant*

Bulbeck, David (Australian National University), Ben Marwick (University of Washington), Sue O'Connor (Australian National University), Ambra Calo (Australian National University) and Jack Fenner (Australian National University)

[7] *The Prehistoric Archaeology of the Routa Region of Central Sulawesi*

At a crossroads between Asia, Australia and the Pacific, our project recognizes Sulawesi as critical to understanding the human history of our region over the past 50,000 years. Sulawesi is strategically positioned to test competing models of initial modern human expansion, and subsequent trajectories of cultural change and interaction. We describe preliminary results of recent survey and excavation in the Routa region of Sulawesi.

Bulgrin, Lon (NAVFAC Marianas)

[73] *The Rosario House At Hagatna, Guam: 18th and 19th Century Commodity Availability and Consumer Choice*

Archaeological test excavations conducted at the Rosario house in 1988 recovered the largest collection of Euro-American and Chinese ceramics discovered to date in the Mariana Islands. This diverse and rich collection was recently cataloged and yielded data giving insight into patterns of commodity availability and choice. This collection is particularly important to the historical archaeology of the Marianas as World War II combat and subsequent battlefield clean-up operations destroyed the major villages throughout the archipelago and severely impacted the historical archaeological deposits that were associated.

Bullion, Elissa (Washington University in St. Louis)

[39] *Children of the Blue Wolf: Working towards an Integrated Linguistic-Historic-Archaeological Approach to Identity in the Orkhon Turkic State*

The First and Second Turkic Khanates (552-630, 682-745 CE) represent a period in Central Asian history of intense political

unification, social hierarchy, and exchange networks. Historic and linguistic research has been conducted based on Old Turkic scripts as well as accounts taken from the Tang and other neighboring polities, while archaeological investigations have been conducted on habitation sites, burials, and monuments throughout Central Asia. However, relying on any one of these approaches proves problematic for the investigation of social identity. This poster explores how linguistic and historic studies, can inform our interpretation of Turkic social identity when combined with archaeological data from burials. Burials can serve as proxies to a range of social identities including kinship, political, and religious among others. Without knowledge of what social identities existed during the Turkic period, it would be difficult to tease out the meaning of practices. On their own, historic and linguistic accounts may be biased by the selective nature of written records, most notably leaving out the experiences of non-elite individuals. But when combined, the historic accounts of political and kinship structure give us a frame of reference within which we can interpret the symbolic and material contents of burials.

Bunce, Michael [263] see Oskam, Charlotte

Bunce, Michael (aDNA lab, Murdoch University, Perth, Australia), Daithi Murray (aDNA lab, Murdoch University, Perth, Australia), James Haile (aDNA lab, Murdoch University, Perth, Australia), Nicole White (aDNA lab, Murdoch University, Perth, Australia) and Joe Dorch (Eureka Archaeological Research, University of West)

[263] *Scrapheap Challenge: Ancient DNA from Archaeological Bone Fragments Provides Insights into Zooarchaeological Assemblages and Past Biodiversity*

Caves in the southwest of Western Australia provide a unique opportunity to study a combined 50,000 year record of past biodiversity and Aboriginal archaeology. Devil's Lair represents one of the oldest dated sites in Australia. Problem Statement: Morphologically indistinct post-cratal bone fragments are of limited use in identifying fauna. Can ancient DNA techniques coupled with next-generation DNA sequencing (NGS) technologies assist in identifications? Data: During recent excavations thousands of small bone fragments were collected. Small sections of these fragments (within each layer) were drilled to form a 'bulk powder' from which ancient DNA was characterized using NGS. Results: Over 35,000 mitochondrial amplicon sequences were generated allowing the identification of a diverse range of taxa dating back to 40,000 years BP. Multiple animal families were identified, ranging from Tasmanian devils to black swans. The methodology advocated here provides a new way to compile a DNA-based zooarchaeological assemblage. Conclusions: The bulk processing method represents a novel, cost-effective use for bone fragments, providing accurate species information on material that might otherwise ends up on the scrapheap. It is anticipated that this approach will become a valuable part of the archaeological toolkit into the future, especially if material is collected and stored appropriately.

Bunten, Alexis (IPinCH)

[118] *Discussant*

Buonasera, Tammy (University of Arizona)

[250] *More than Acorns and Small Seeds: Extra-Utilitarian Aspects of Ground Stone from the South San Francisco Bay Area*

At European contact, central California was occupied by nonegalitarian hunting and gathering peoples dependent on the storage and processing of acorns and other plant resources. Ground stone milling tools were integral to economic and social transformations in California prehistory, and variation in their morphology, manufacturing costs, uses, and associations may

reflect social and ideological changes as well as purely economic shifts in resource use. However, historical trends in research objectives, along with assumptions about the entirely mundane character of ground stone tools, have caused much of the variability and many "extra-utilitarian" aspects of these artifacts to be overlooked. This study analyzed synchronic and diachronic variability in form, manufacturing effort, and use-wear among grave-associated ground-stone artifacts spanning approximately 6,000 years of prehistory in the southern San Francisco Bay Area. An overtly symbolic dimension associated with mortars and pestles seems to emerge during the Late Holocene with the addition of highly formalized and expensive flower-pot mortars, very long shaped pestles, and additional embellishments such as shell bead appliquéd and painted designs. Large, costly, and embellished mortars exist alongside less costly, smaller, less formalized milling tools. Archaeological and ethnographic evidence supports the inferred association of certain mortars with feasting and ritual activities.

Burch, Ashley (JPAC-CIL), Jennie Jin (JPAC-CIL), Carrie LeGarde (JPAC-CIL) and Elizabeth Okrutny (JPAC-CIL)

[251] *Don't Be Fooled by Taphonomy*

Taphonomy has been a useful tool in the forensic community for segregating commingled remains and is currently utilized by the Joint POW/MIA Accounting Command Central Identification Laboratory (JPAC CIL). In the early 1990s, 208 boxes of American remains were turned over by the Democratic People's Republic of Korea to JPAC CIL. Each box was purported to contain a single individual; however, further assessment of the boxes revealed the remains to be highly commingled. Currently, through mitochondrial DNA (mtDNA) testing and anthropological methods, the remains are being segregated from the commingled assemblage into single individuals. Taphonomy has been beneficial as a method of further segregation in cases where multiple individuals are represented in remains sharing a single mtDNA sequence and exhibiting multiple taphonomic patterns. Alternatively, this project has also encountered a single box of remains that appears to be consistent in taphonomy, size, and morphology, as well as lacks any duplication of elements (suggesting MNI is one), yet mtDNA results show that the box contains multiple mtDNA sequences. Similar taphonomic characteristics may be misleading and should not be used as the only method of sorting commingled remains; however, when used with other methods, taphonomy remains a useful tool for segregation.

Burch , Ashley [22] see Jin, Jennie

Burger, Richard [164] see Salazar, Lucy

Burham, Melissa (University of Arizona)

[160] *Social Complexity on the Periphery: The Implications of Ceibal's Very Minor Centers*

The lowland Maya site of Ceibal has an almost two-thousand-year occupation beginning in the Middle Preclassic period and continuing until the Terminal Classic. As such, this site provides invaluable insights into the emergence of social complexity and how elites maintained social hierarchies through time in the lowland Maya region. Arguably, in order to explore these questions, it is necessary to focus on lesser elite and commoner populations residing on the peripheries of political centers. In the 1960's, Gair Tourtellot surveyed the peripheries of Ceibal to understand changes in occupational patterns throughout the site's history. He found many minor ceremonial centers that also have long, continual occupations. Building on Tourtellot's survey, two very minor ceremonial centers on the periphery of Ceibal's main ceremonial Group A were excavated during the 2012 field season of the Ceibal-Petexbatún Project. The results of these preliminary finding provide valuable information about the social and political nature of these minor centers on the peripheries.

[160]

Chair

Burke, Adrian (Université de Montréal)

[229] *Geochemical Characterization of Obsidian from the Toluca Valley using XRF*

In 2010, the lead author carried out geoarchaeological fieldwork in the northeast valley of Toluca, sampling obsidian from two sources: Siffari, near Jocotitlán (secondary surface deposits), and Las Palomas, east of Temoaya (bedrock outcrop). Our objective was to characterize local obsidians from the Toluca Valley in order to assess their role in the regional Postclassic economy. We also wanted to see if people at the ancient city of Calixtlahuaca were using these raw materials during the Aztec period. This may be significant given that Calixtlahuaca is the only Late Postclassic obsidian assemblage from Central Mexico that is not dominated by green obsidian. We present new quantitative data on the geochemistry of obsidian from these two sources based on polarized, energy-dispersive X-ray fluorescence (ED-XRF). XRF data for Calixtlahuaca archaeological samples is also compared to our geochemical data for Siffari and Las Palomas and other published data for obsidians from central Mexico.

[142]

Discussant

[62]

Chair

Burke, Adrian L. [62] see Gauthier, Gilles

Burke, Ariane (Université de Montréal)

[215] *The Impact of Climate Variability on the Spatial Distribution of Human Populations during the Last Glacial Maximum*

Human sensitivity to short time-scale (interannual) climate variability is explored using the spatial distribution of archaeological sites during the Last Glacial Maximum (LGM) in the Iberian Peninsula and high-resolution (10x10 km²) climate simulations. We demonstrate that anatomically modern humans responded to climate variability, particularly fluctuations in precipitation levels, during the LGM by adjusting their spatial distribution. Climate variability during the LGM, therefore, is potentially an important factor to consider when investigating the pattern of human population expansion during and after a period of initial colonization.

[215]

Chair

Burke Davies, Clare (University of Sheffield Department of Archaeology), Peter. M. Day (University of Sheffield Department of Archaeology), Anno Hein (Institute of Materials Science, NCSR Demokritos), Aggeliki Kossyva (4th Ephorate of Prehistoric and Classical Antiquity) and James. R. Wiseman (Department of Archaeology, Boston University)

[288] *Settlement Scale, Pottery Production, and Patterns of Consumption in Early Helladic Korinthia and the Argolid.*

The third millennium BC in the Aegean has received considerable attention in attempts to explain the rise of palatial centers, which emerged during the second millennium, focusing on changes in craft technology and specialization as an impetus for societal change.

However, this narrative of change has been constructed at the expense of a coherent picture of the character of Early Bronze Age crafting practices and the degree of interaction between communities. The present project examines ceramic material culture in Early Bronze Age of Mainland Greece. In work which integrates macroscopic, petrographic, chemical and SEM analysis of Early Helladic II ceramics from Korinthia and the Argolid, it examines the varied ceramic landscape of these areas, relating new understandings of provenance and technology to issues of scale, both in terms of settlement size and craft production.

Building on previous work by NAA, undertaken by Michael Attas, we suggest instances of localized small-scale production and juxtapose these with evidence of larger scale production in some centers, whose products have a broad distribution.

Burkholder, Jo (University of Wisconsin - Whitewater)

- [132] *Oval Structures and Wari D-shaped Temples: What Is the Relationship?*

Recently published survey of archaeological sites in the Sihuas Valley, Department of Arequipa, Peru, claims that the site of Pisanay contains two Wari D-Shaped Temples. If so they are rare features of Wari architecture outside of its Ayacucho homeland. But are these D-Shaped structures? This paper will consider the archaeological evidence for the relationship between Pisanay's oval structures and the documented D-Shaped structures built by the Wari culture.

- [232] *Discussant*

Burks, Jarrod [34] see Stone, Suzanne

Burks, Jarrod (Ohio Valley Archaeology, Inc.)

- [34] *Magnetic Susceptibility and Its Use in Distributional Surveys on Historic and Prehistoric Sites in the Midwest U.S.*

Magnetometry has become an indispensable tool for locating buried prehistoric and historic features in the Midwest U.S. Whether earthwork sites, hunter-gatherer camps, Late Prehistoric villages, or historic farmsteads, magnetometers readily detect buried pit-type features and burned areas. However, they are not so useful for mapping the extent of site middens. In contrast, magnetic susceptibility surveys represent a very quick way to generate low-density maps of midden distribution across huge areas. A low density survey could cover 30+ acres in a day. Because susceptibility meters are relatively affordable compared to other instrument types, such surveys are very cost effective, fast ways to non-invasively locate sites and gather information about site structure. In this presentation I explore the use of magnetic susceptibility surveys on a range of prehistoric and historic sites in the Middle Ohio Valley. Magnetic susceptibility data collected at a 5-20 meter interval are shown to be useful for (1) locating areas on the landscape for conducting more intensive magnetometer surveys, (2) revealing gross site structure data much like one acquires through artifact distributional surveys (e.g., finding plazas and determining overall site size and shape), and (3) identifying distinctive activity and/or refuse disposal areas.

Burley, David [5] see Wong, Megan

Burley, David

- [27] *First Settlement and Population Expansion Reconsidered in West Polynesia*

The Kingdom of Tonga is the first island group to be settled in Polynesia, with first landfalls by Lapita peoples on the island of Tongatapu ca. 2850 cal B.P. A two decade long study of Lapita sites throughout the archipelago has resulted in over 50 AMS radiocarbon dates on wood charcoal documenting a south to north population expansion over the next millennium, ultimately reaching Samoa and other islands of West Polynesia. The precision of the radiocarbon record, however, has been questioned, given the potential for in-built age in unidentified wood species, among other issues. Recent identifications of wood charcoals for many of the previously dated samples, high-precision U-series dating of coral file artifacts, and Bayesian modeling of respective dates provide a highly refined and robust sequence for population expansion. Its implications for Polynesian origins are examined.

Burnett, Scott [37] see Stone, Jessica

Burnett, Paul (SWCA Environmental Consultants)

- [265] *Disaster Plan: Probability Modeling in Northwest Colorado*

The diverse archaeological record of Northwest Colorado is at risk from two particular drivers: wildland fires and energy development. While physical disturbances such as well pads may receive standard cultural resource inventories, there is a lack of broader guidance to address at-risk archaeological areas prior to their destruction. For example, given that much of the area has not been surveyed for cultural resources, both prescribed and wildland fires are completely destroying wooden structures (such as wickiups) and damaging other resources such as prehistoric camps. Similarly, archaeological resources are at risk of destruction where cultural studies are not permitted on private lands during oil and gas development. In an attempt to at least partially address these related issues, probability models were developed for various archaeological site types across Northwest Colorado. These models identify sensitive areas that should be given further consideration and/or avoidance during industrial development and prescribed fires. Discussion of these matters includes the resources at risk, model mechanics, high probability avoidance areas, and what can happen when avoidance is not achieved.

Burns, Gregory (University of California, Davis)

- [153] *Models for Evolution of Money in Simple Societies*

Although the use of general purpose money and intensively monetized economic systems is generally associated with the emergence of state level political organization, some simple societies, such as the Hupa and Yurok of California and the Kapauku of New Guinea, developed highly monetized economies. Money fills many roles, but two specific functions standout for their significance in simple societies - reducing transaction costs and eliminating obligations inherent to reciprocal trade. Based on these functions, we present two models for the evolution of money in the absence of centralized authority, evaluate each in light of ethnographic examples, and consider implications for the archaeological record.

Burton, James [37] see Cucina, Andrea

Burton , James [288] see Cheetham, David

Bush, D'Nisha [237] see Gabany-Guerrero, Tricia

Butler, Sarah [48] see Giessler, Kalena

- Butler, Michelle (University of California, Riverside), Arthur Joyce (University of Colorado, Boulder), Jeffrey Brzezinski (University of Colorado, Boulder) and Kathleen Paul (Arizona State University)**

- [63] *Teotihuacan and Oaxaca: Social Transformations at the Scale of the Local Community and the Polity*

Current debate regarding the impact of Teotihuacan in Oaxaca has centered almost exclusively on the degree to which Teotihuacan politically dominated various regions. However, much of the evidence from Oaxaca suggests that interaction may have been mutually beneficial, involving migration and the exchange of cultural materials among multiple groups of people. In this paper, we discuss the current evidence for a Teotihuacan presence in coastal Oaxaca and the role it may have had in generating new constellations of social and political identities at both the local

community and the polity scales. Revising the scales at which archaeologists investigate interaction provides a fuller understanding of how these networks transformed identities and power relations. Teotihuacan-related materials found in communal ritual contexts in the lower Rio Verde valley of Oaxaca's Pacific coast suggest that interaction with Teotihuacan provided communities with new material and ideological resources to reestablish themselves as competing political authorities after the collapse of Rio Viejo, while simultaneously referencing traditions of the region's shared history. Refocusing attention on communal practices and identity enables the evaluation of communal affiliations in relation to emerging political forces, and the degree to which identity was being asserted in both local and interregional networks.

Butler, Virginia (Portland State University)

[170] *Discussant*

Butler, Don (University of Calgary) and Peter Dawson (University of Calgary)

[224] *Clarifying Hunter-Gatherer Site Structures Using Fourier Transform Infrared Spectroscopy: A Case Study from a Taltheilei Settlement in the Canadian Subarctic*

Fourier transform infrared spectroscopy of soils and reference materials provides an accessible, rapid, and cost effective means of discovering micro-archaeological evidence valuable for reconstructing hunter-gatherer site structures. Our case study at a tundra-based Taltheilei settlement (ca. A.D. 500 and 650) in northern Canada contributes to developing micro-archaeological approaches suitable for locating and defining hearth and midden features on hunter-gatherer sites. A weak yet pervasive signal for montgomeryite was developed from the diagenesis of dispersed ash and caribou processing residues. An absence of spatially patterned carbonated apatite and authigenic phosphates in soils from across the settlement and an abundance of burned bone and carbonated apatite in two pit-house hearths indicate that some bone was not discarded, but was rather used as fuel. Crystallinity indices and carbonate/phosphate ratios for burned bones indicate high intensity burning. These data, along with the presence of semi-subterranean dwellings, demonstrate that the tundra-based Ikrakah settlement was occupied during cold seasons, which is a type of settlement behavior previously unrecognized in the Taltheilei archaeological record.

Buvit, Ian [222] see Izuhoh, Masami

Buvit, Ian

[233] *Late Quaternary Stratigraphy of the Shimaki Paleolithic Site*

Excavations at the Shimaki site ($N43^{\circ}14'$, $E143^{\circ}18'$) revealed a Paleolithic component fission-track dated to $21,700 \pm 1800$ cal BP with a wedge-shaped "micro" core and thousands of other flaked-stone artifacts. The site profile is divided into four lithostratigraphic units. The lowest, Unit I, comprises coarse sediments representing lateral accretion of a meandering river. Moving upward, Unit II is the Sipfa-2 Tephra (ca. 43,000 cal BP). The fall was so thick at Shimaki that it altered the course of the river, causing a shift from bar to floodplain deposition. Unit III comprises a thick bed of silty deposits laid down on an actively building floodplain. Several buried soils were identified within the unit, evidence of landform stability and perhaps environmental change; the Paleolithic cultural layer was discovered within one of these soils. Unit IV overlies the archaeological component and is preliminarily identified as the Sipfa-1 Tephra (ca. 19,000 cal BP). It appears that the cultural layer represents a pre-last glacial maximum occupation when inhabitants were utilizing a relatively high stable alluvial terrace.

[233] *Chair*

Byerly, Ryan

[58] *Late Holocene Drought and Mojave Desert Archaeology: Perspectives from Twentynine Palms and Johnson Valley, California*

Myriad research has focused on the nature of human adaptations to prolonged drought in the Mojave Desert during the Medieval Climate Anomaly (MCA) (600-1150 cal BP). Interpretations regarding the consequences of these droughts, which are well-defined by paleoclimate reconstructions, range from having little effect on regional settlement systems, to prompting drastic shifts in community organization, subsistence pursuits, and conveyance networks. Here, various data gathered from site evaluations at the Marine Corps Air Ground Combat Center in Twentynine Palms, California and nearby Johnson Valley, are reviewed and presented to provide a focused perspective of how MCA conditions might have affected local settlement. The degree to which upland resources and habitats may have been utilized is emphasized in this review.

Byington, Mark (Harvard University) and Sunmi Park

[289] *Problems Concerning the Bronze Antenna Daggers of Northeast Asia*

Among artifacts of the late Bronze Age and early Iron Age in northeast Asia, the so-called antenna dagger is particularly interesting in that it is highly diagnostic and, despite the small number of known specimens, spans a broad (but longitudinally narrow) region from northeastern China, through the Korean peninsula, and to southwestern Japan. Until the late 1990s the majority of antenna dagger finds in this region have lacked archaeological context, but this has changed recently with a number of excavations in Korea and China, allowing a more precise study of typological variation, chronology, and social context. This paper proposes to analyze the full range of known specimens of this dagger type in order to determine their developmental processes, their geographical propagation, and their social significance. I intend to highlight the anomalous character of these daggers as atypical artifacts regardless of the region in which they are found, and attempt to account for their unusual distribution patterns as reflective of attempts to express chiefly authority in regions characterized by extended sociopolitical flux and intensive inter-regional exchange.

Byrd, Brian [2] see Whitaker, Adrian

Cabo, Luis (Mercyhurst University) and Dennis Dirkmaat (Mercyhurst University)

[193] *Defining Forensic Anthropology*

The last two decades have witnessed the growth and widespread recognition of forensic archaeology as an important field within the forensic sciences. A recent poll taken among members of the Physical Anthropology section of the American Academy of Forensic Sciences revealed that most of those professionals prefer processing the outdoor forensic scene themselves, and using forensic archaeological techniques over conventional criminalistic protocols for this task. However, while recognizing taphonomy and archaeological recovery techniques as some of the main skills in the forensic anthropology toolkit, they showed little appreciation for more conceptual contents of archaeological theory. Similarly, at least two major schools have arisen regarding the nature and scope of forensic archaeology. One of them, mostly composed of American practitioners educated in the four-field approach, sees forensic archaeology as a sub-discipline of forensic anthropology. The second one, based mainly in the United Kingdom, considers forensic anthropologists and forensic archaeologists as separate entities. This presentation discusses the main outputs that, in our view, a forensic archaeological recovery should display in order to be recognized as such, and the very basic practices that must be included in the recovery protocol to produce those outputs.

Cachola-Abad, Kehaunani (University of Hawai'i at Manoa)
[203] *Discussant*

Caffrey, Maria A. [124] see Carmody, Stephen

Cagnato, Clarissa (Washington University in St. Louis)

[217] *Integrating Macro- and Microbotanical Remains to Reconstruct Ancient Maya Plant Use in Northwestern Petén, Guatemala*

With the exception of a few projects—mostly all outside the region of Petén—paleoethnobotanical analyses have not been readily applied on samples collected in the Maya area. The result is a limited appreciation of the variability of ancient Maya diet and the use of plants in ritual contexts through space and time. To address this issue, and gain a better understanding of plant use by the populations that inhabited this region of the tropical forest during the Classic Period (A.D. 250- 900), I conducted both macro- and microbotanical investigations at the sites of El Perú-Waka' and La Corona, situated in northwestern Petén, Guatemala. This paper integrates recent data in the form of macrobotanical remains and starch-grains collected from a wide range of contexts, including chultunes, middens, and burials. The results allow for species to be added to the list of known plants used by the ancient Maya, and further support the notion that ancient plant use was diverse and complex. Moreover, the continuity visible between species found in the archaeological record and those used in contemporary contexts support the importance and relevance of systematically including paleoethnobotanical analyses in the general scope of future archaeological projects in the Maya region.

Cai, Dawei [68] see Zhao, Xin

Calaon, Diego [221] see Seetah, Krish

Calfas, George (University of Illinois at Urbana-Champaign), Michelle Birnbaum (University of Wisconsin-Milwaukee) and John Richards (University of Wisconsin-Milwaukee)

[25] *These Pots Talk: Where Were Face Vessels Manufactured?*

Portable X-ray fluorescence (pXRF) analysis was used to determine the elemental composition of 23 complete stoneware Face vessels from "The Edgefield District", an archaeological region in South Carolina. The Edgefield District was the locus for alkaline glazed stoneware in the United States from 1810 until Present. Entrepreneurs established thirteen kiln sites throughout the district and utilized enslaved African-American laborers to manufacture locally needed utilitarian vessels. Face vessels have been linked to the bonded laborers; some of which arrived illegally in America after the abolishment of the transatlantic slave trade. Previous research conducted with a Scanning Electron Microprobe (SEM) analyzed waster fragments from seven kiln sites and determined a unique elemental fingerprint for each. Those waster samples were re-analyzed with pXRF in an effort to compare pXRF and SEM data. The resulting calibration is used to develop a non-destructive method of determining the elemental composition of the face vessels and associate specific vessels with the locus of production.

Calfas, George [183] see Baxter, Carey

Callaghan, Richard [47] see Montenegro, Alvaro

Callaghan, Michael (Southern Methodist University)

[59] *Discussant*
[171] *Chair*

Callaghan, Richard (University of Calgary)

[167] *Changing Perceptions of Paths of Migration and Interaction in Caribbean Prehistory*

For over a century much of the discussion of paths of migration and interaction in Caribbean prehistory was strongly influenced by the geography of the region. Almost all movement in the islands was seen as following a linear pattern with Cuba in the northwest and Trinidad in the southeast being the main entry points. Recently a number of archaeologists have abandoned the "stepping stone" vision of maritime movement. This has led to the proposal of many new hypotheses about migration routes and interaction spheres. Interestingly some early scholars were also not confined in their ideas by the linear configuration of the islands.

Calo, Ambra [7] see Bulbeck, David

Calo, Ambra (Australian National University, College of Asia and the Pacific)

[216] *Bronze, Copper, and Gold from the Metal Age Sites of Sembiran and Pacung, Bali, Indonesia: Exchange and Local Production*

The adjacent Metal Age burial sites of Sembiran and Pacung on the north coast of Bali, Indonesia, dated from the 2nd century B.C.E. to the mid first millennium C.E., are critical for understanding trans-Asiatic exchange networks involving metal, the transmission of metal technology and the rise of local traditions in Island Southeast Asia (SEA). The sites are likely to have been part of an ancient harbor located at a strategic crossroads along a major maritime route between eastern and western Indonesia and were also linked to the southern part of Mainland SEA and to India, having produced evidence of local bronze casting of a local type of bronze drum and the greatest amount of Indian pottery found in a single Metal Age site in SEA. New excavations have produced bronze, copper and gold artifacts which are being analyzed within wide-scope comparative studies of samples across SEA with the aim to identify metal deposits, primary and secondary production centers and region-specific technological innovations.

Calvert, Kaitlyn [284] see Homsey, Lara

Cambre, Rosemary [79] see Monroe, Cara

Cameron, Catherine (University of Colorado)

[273] *The Variability of the Human Experience: Marginal People and the Creation of Power*

The human experience in prehistoric non-state societies was variable even for individuals in the same community and the well-being of individuals was often opposed. Positive experiences for one individual or family could result in negative experiences for another. The paper focuses on marginal people exploited for the gain of others. In non-state societies where relationships and power are predicated on kinship, those without kin are at a disadvantage. Such people include orphans, the illegitimate, and -- the social category on which I will focus -- captives. Captives are the product of warfare, raiding, or kidnapping and they have been found in societies worldwide and through time. In many non-state societies, captive-taking was a primary goal of warfare and was closely linked to male status striving. Captives were most often women and children and they could become wives, adoptees, or slaves. Regardless of their status, they could enrich their captors either through increasing the captor's group size or through labor

which increased the captor's wealth. In non-state societies where captives became slaves or other subordinates, they could also increase captor status through public display of the contrast between the superior master and degraded slave.

[65] *Discussant*

Cameron, Catherine [218] see Damp, Nicholas

Campana, Michael (Centre for Evolutionary Medicine/Harvard University), Nelly Robles Garcia (Instituto Nacional d Antropología e Historia), Frank Ruehli (Centre for Evolutionary Medicine) and Noreen Tuross (Harvard University)

[114] *Disease, Death, and DNA at Teposcolula Yacundaa, Oaxaca*

Excavations at Pueblo Viejo, Teposcolula Yacundaa (Oaxaca District, Mexico) revealed a large burial ground. Demographic data and archaeological dating revealed that this cemetery likely contained victims of the 16th century cocolitzli ('pest' in Nahautl), a plague that decimated native Mexicans during the early colonial period. The disease agent for this disease remains unknown, although suggested pathogens include typhus and viral hemorrhagic fevers.

Using high-throughput ancient DNA sequencing technologies, including the Helicos BioScience HeliScope, we are investigating the skeletal remains at Teposcolula Yacundaa to determine the identity of this ancient pathogen. This is the first high-throughput ancient DNA sequencing project attempting to identify an unknown historic pathogen. We will present the methodologies we have developed, the pitfalls we have encountered and our current results

Campbell, Roderick [66] see Li, Zhipeng

Campbell, Gregory (The University of Montana)

[75] *Reclaiming the Land: Historical Memories, Cultural Landscapes, and Cultural Identity*

American Indians perceive aspects of land and resources as critical to their maintenance and continuance as distinct peoples. Landscape aspects are a vital link to the past as well as provide for many of the values, traditions, and materials that are necessary for the continuation of cultural practices. Historically the Ute were alienated from a significant portion of the landscape they previously inhabited and used. Using ethnological and ethnohistorical data the presentation explores the way in which the Ute have employed historical and social memories that remain a critical cultural and religious component of the traditional landscape that creates and reinforces their cultural identities.

Campbell, Rachel (University of Arkansas)

[90] *Fourche Valley Site: Use-Wear of Double Bitted Axes*

The cultural material from surface collections at the Fourche Valley site contains numerous double bitted axes, the use of which has not been previously analyzed. This site represents the Fourche Malling time period, a transitional late Archaic – Woodland complex in the Ouachitas Mountains, located near Hot Springs, Arkansas. The goals of the research at the site included determining the original function of the tools, the types of material the tools came into contact with during use, their maintenance or repair, and when the tools were no longer able to function for their original purpose. In addition, the research addressed when the tools were further modified, recycled, or abandoned. Microscopic use wear on the tools was identified and analyzed through the use of high resolution epoxy casts and complemented by experimental replicas.

Campbell, Roderick (Institute for the Study of the Ancient World)

[179] *Fragments of the Shang: Time, History, and Narrative*

Time, together with space, forms the foundation of archaeological knowledge, and like a foundation, once securely in place it tends to recede in favor of the structures built upon it. But time is no more reducible to chronology than space is to mere physical coordinates. Archaeology is itself a spatiotemporal narrative practice, embedded within particular notions of temporality, process and world. Archaeologists, moreover, occupy a relational position between their own time-spaces and the pasts they seek to know and narrate.

Using the case of the Shang dynasty, this paper will explore the ways that fragments of the Shang have been gathered into representational wholes again and again, serving disparate modes of past-consciousness down to the present where archaeologists, historians and epigraphers of different national traditions and stakes struggle over its narrative.

Campbell, Jennifer (SUNY Potsdam)

[221] *Heritage Goes Viral: Internet Communication Technologies and the Production, Consumption, and Authentication of the Past.*

Decisions about heritage travel are influenced by the ability of the locale in question to self-promote its cultural or historic identity and authenticate its presentation of a legitimate past. In the west; tourists are increasingly engaged through digital media and internet communication technologies (ICT's) and plan journeys around the history of a region, route, and/or place. This raises important questions for heritage producers in areas of the world with low or lacking penetration of ICT's. How do we translate the production of digital heritage and of heritage management into regions where these fields have taken a back seat to more pressing national discourse? Heritage decisions in these instances can be made for tourists; as heritage tours are planned and presented in "packages to the past". What happens though when the heritage narrative changes; or new narratives find their voice? Who ultimately orchestrates historic memory and directs travel along the transit systems of time? With the above in mind, I explore how the medieval routes and way-stations of northern South Asia derive meaning in the present through their ongoing construction as heritage places; an unfolding process impacted by the politics of the digital divide.

Cannon, Aubrey (McMaster University)

[24] *Protocols in Residential Site Placement and Regional Interaction on the Northwest Coast*

Three residential sites on the central coast of British Columbia show a 2500 year foundation for interactions between Heiltsuk and Wuikinuxv, First Nations that are highlighted within oral tradition, historical events, and contemporary issues. Site locations determined opportunities for boundary maintenance and interaction between interior inlet and lake, protected inner coast, and outer coast environmental zones. The stability of residential patterns suggests longstanding protocols governing relations between groups. A similar role is suggested for 6000 year old residential sites a short distance to the north at the entrance of an inlet route into interior Nuxalk territory. Together these patterns point to protocols for regional interaction involving fluidity of action within a stable pattern of group identities and territorial rights. This type of fluid stability, which may often characterize interaction among hunter-fisher-gatherers, suggests a more generalized conception of borders as areas of socio-political mediation between zones of environmental/cultural difference.

Cannon, Aubrey [71] see Roth, Melissa

Cannon, Joshua (University of Chicago)

[191]

A Model for Western Anatolian Cultural Influence in Greece

Western Anatolia is located between two widely studied political and cultural spheres: the Aegean and Central Anatolia. Historically, studies of Anatolia and the Aegean have been dominated by a largely cultural-historical approach. Recently, however, the interaction of these regions has begun to receive a greater amount of anthropological attention. This presentation contributes to this momentum by examining the complex sequence of cultural interactions that occurred between western Anatolia and its immediate neighbors. Archaeological evidence has illustrated that this region provides a multitude of unique and diverse perspectives on cultural interaction extending back at least as far as the Neolithic.

This paper examines a segment of this broad time frame to propose a model for how earlier and later forms of cultural contact may have transpired in this geographical and cultural setting. Focusing on the presence of western Anatolian cultural elements in Late Bronze Age Mycenaean Greece, this research presents an examination of cultural diffusion that may be indicative of a greater sequence of such interactions. The research takes advantage of the rich textual record from this region and time period (Hittite cuneiform, Mycenaean Linear B), allowing it to draw from several academic disciplines, primarily anthropology, philology, history, and archaeology.

[191] *Chair***Cannon, Mike (SWCA Environmental Consultants)**

[207]

Great Basin Hunter-Gatherer Subsistence, Settlement, and Labor Division: A Case Study from the Little Boulder Basin

Synthetic analysis of subsistence-related data from late Holocene hunter-gatherer sites in the Little Boulder Basin, northern Nevada, has revealed compelling relationships among climate, prey choice, and technology. In this poster, settlement pattern data from the region are incorporated into the analysis in order to provide further insight into prehistoric human adaptations. Altogether, it appears that not only did subsistence and technology change over time in response to climate change, but that several dimensions of mobility also did. Most notably, it appears that men's and women's mobility patterns may have responded differently in a manner that is made understandable by central-place forager models.

Canuto, Marcello (M.A.R.I./Tulane University)

[287]

*Discussant***Capelotti, Peter (Penn State Abington College)**

[13]

Mobile Artifacts in the Solar System and Beyond

Once a spacecraft no longer responds to signals from Earth, it ceases to be used for the original mission for which it was designed, and becomes instead a discarded, and hence, archaeological, object. This is the case with the Pioneer 10 space probe, which ceased 'speaking' with Earth in 2003, and is now headed on a two million year journey toward the red star Aldebaran. But, in space as on Earth, these strict categories of systemic and archaeological context are not absolute. It is possible for an object to move in and out of context. This paper examines whether or not a mobile artifact is in fact an object for archaeological study and, if so, the new categories of archaeological methodology that seem to be called for if we are to consider the possibilities of fieldwork on the now dead—or soon-to-be dead—spacecraft we have launched on their way to distant stars.

Capriata Estrada, Camila (Camila Capriata Estrada)

[108]

Behind Closed Doors: Private Ritual Practice at Panquima

Archaeologists often look to ritual activity and specialized craft production to disentangle the complexity behind social dynamics within sites. Recent findings at Panquima, a multi-component Late Intermediate Period (900-1400 AD) site located in the central coast of Perú, have not only revealed the importance of ritual activity inside of domestic spaces but also demonstrate that elites were not the only arbiters of ritual practice. Ancestor veneration and fertility rituals, among others, bring attention to the multiple ways in which local residents of Panquima expressed their (religious) beliefs outside of public spaces. This new evidence also suggests that non-elites had access to locally and non-locally produced prestige goods. Moreover, zoomorphic representation and the presence of specific animals (e.g. snakes, ducks, sea mammals) found in certain rituals support the hypothesis that a shared cosmology existed throughout the Andes prehispanic times. You have room for another sentence here.

[108]

Chair

Capriles, José [38] see Maley, Blaine

Capriles, Jose (University of Pittsburgh) and Steven Goldstein (Washington University in St. Louis)

[80]

Early Holocene Highland Hunter-Gatherers: Settlement Pattern, Subsistence, and Technological Organization from the Bolivian Andes

Recent archaeological and paleoenvironmental research from southern Peru, northern Chile and northwest Argentina, has substantially expanded our knowledge of early human adaptation to the Andean highlands. In this paper, we contribute to this regional research by providing evidence of early Holocene hunter-gatherer behavior from the Bolivian central altiplano. At Iroco, high intensity full-coverage survey produced the identification of 35 Archaic Period open-air sites. In addition, systematic surface collections and excavations at one of these sites allowed recovering a significant sample of faunal remains, lithic tools and debitage dated to approximately 9000 years ago. Analysis of the lithic material provides evidence for a technological package that incorporated a highly curated toolkit, a range of prepared core reduction strategies, and the intentional selection of high quality raw material. The faunal evidence suggests the consumption of locally available fauna, including guanacos, wild guinea pigs and aquatic birds. Together, the information from Iroco supports a settlement system characterized by high logistical mobility, broad resource utilization, and an emphasis on flexibility rather than specialization, which is consistent with archaeological interpretations from neighboring regions.

Carabajal, Catherine [183] see Twaroski, Rebecca

Carballo, David (Boston University, Department of Archaeology), Luis Barba (Instituto de Investigaciones Antropológicas), Agustín Ortiz (Instituto de Investigaciones Antropológicas) and Jorge Blancas (Instituto de Investigaciones Antropológicas)

[166]

Mapping the Northeastern Tlajinga Barrio at Teotihuacan

Anthony Aveni's distinguished career has included celestial consideration of the urban layout of the ancient Mexican metropolis of Teotihuacan. The work presented here continues on his path, but from the ground, with new surface mapping and terrestrial remote-sensing in the northeastern sector of the Tlajinga Barrio. Previous work in this southern neighborhood includes the comprehensive study of one of its apartment compounds (Tlajinga 33), but some fifty others remain virtually unknown. By combining magnetometry, soil-resistivity, ground-penetrating radar, and reconsideration of Teotihuacan Mapping Project collections, we offer preliminary suggestions for the spatial organization of this part of the neighborhood and for how it articulated with the rest of

the city through the previously unexplored southern Street of the Dead.

[231] Chair

Carballo, David [231] see Barba, Luis

Carballo Marina, Flavia [26] see Nuevo Delaunay, Amalia

Cardillo, Marcelo [26] see Borrazzo, Karen

Carey, Bern [218] see Peters, April

Carleton, William (Simon Fraser University) and Mark Collard (Simon Fraser University)

[58] *Debating Drought Cycles and Their Influence on Maya Society*

This paper focuses on the idea that repeated severe droughts had a major impact on the ancient Maya. In 2001, Hodell et al. (Science 292, 1367-1370) reported time-series analyses of sediment cores covering the last 2600 years from a lake in the north-central Yucatan Peninsula. Hodell et al.'s analyses indicated that the peninsula was affected by severe droughts every couple of hundred years. The lowest precipitation points in the drought cycles occurred at the same time as important changes in Maya cultural practices, which Hodell et al. argued was indicative of a causal relationship. Hodell et al.'s findings have been widely discussed. However, their results are potentially problematic because the methods they employed can impose periodic signals on data. With this in mind, we reanalyzed the Hodell et al.'s data from Lake Chichancanab using a technique designed to identify periodicity without assuming its presence a priori or creating it artificially. Contrary to Hodell et al., we found no evidence of a drought cycle with a bicentennial periodicity. Our results suggest that the hypothesis that periodic droughts shaped Mayan cultural evolution requires further scrutiny.

Carlisle, Christel (University of Alabama Birmingham) and Sharyn Jones (University of Alabama Birmingham)

[182] *Archaeology after the Field: Appreciating and Restoring the University of Alabama at Birmingham's Collection*

The Anthropology Department of the University of Alabama at Birmingham possesses an archaeological collection comprised of artifacts from years of field work as well as portions of collections amassed and donated by amateur archaeologists. Many of the sites around Birmingham have been destroyed by development, making this collection one of the few resources available for research of local prehistory. This collection is also important because it provides information about the Woodland Period (ca. 1000 BC- AD 1000) for Birmingham and the surrounding area. The goal of this research is to identify the strengths and weaknesses of UAB's collection, to reveal its research potential and to begin a process of organizing and preserving the collection. The department has begun a process of inventory and organization of the collection, providing graduate and undergraduate students with opportunities for practical application of classroom skills. In order to facilitate the improvement of the curation, this research examines the best practices, policies and procedures of university and other institutional collections in the Southeast. The result of this research is a draft of a Collections Management Policy tailored to the UAB collection.

Carlson, Kristen (University of Oklahoma)

[116] *The Development of Paleoindian Large Scale Bison Kills: A Comparison of Northwestern to Southern Plains Arroyo Traps*

The purpose of this paper is to compare early Paleoindian mass bison kills on the southern Plains to analogous sites on the

northwestern Plains to investigate the development of specialized hunting techniques. Analyses to address this problem include: Stable isotopes of bison bone to aid in environmental reconstruction; radiocarbon dates to determine the antiquity of the sites being compared; herd demographics, including age, sex, and the seasonality of the kill event to relate hunting organization to bison behavior; examination of butchering programs to determine the extent of resources obtained from the animals; and lastly, examination of lithic materials to determine the possible aggregation of otherwise separate hunting groups to gain the requisite number required to complete complex maneuvering of bison herds into arroyo traps. This research provides a new perspective on the appearance of large scale bison hunting that developed during the early Paleoindian period in North America.

[116] Chair

Carlson, Eric (Historical Research Associates)

[120] *Mass Harvesting, Processing, and Food Storage at the Late-Prehistoric S7i7stkn Site (Little Pithouse site), Middle Fraser Region, British Columbia*

Mass harvesting, processing, and storage of certain food resources is a distinguishing characteristic of complex hunter-gatherer societies. Food storage made possible the establishment of large sedentary, or semi-sedentary, prehistoric hunter-gatherer villages, and is often associated with emergent social inequality, warfare, and other sociocultural characteristics which differ from traditional forager groups. Recent excavations at the S7i7stkn Site (Little Pithouse site), a small late prehistoric village site in a highland area in the Middle Fraser Region of Southern British Columbia, have revealed intact food storage caches containing salmon, deer, and plant resources built into the interior rim of Housepit 1, a large multi-family residential structure. All storage caches in HP 1 are associated with only the later of two successive occupations (ca. 500 BP), suggesting a dramatic change in function and possible social organization over time within the house. The remains of intact food resources at the base of the storage caches allow insights into diet, food processing techniques, and food sharing practices within the House. Storage caches at S7i7stkn are markedly different than those of the 200 BP occupations at the Bridge River Village site, located only 3 km away.

Carlson, Risa (University of Cambridge)

[137] *New Discoveries and Updates on the Early Holocene Predictive Model Sites in Southern Southeast Alaska*

This paper presents the latest discoveries from the new Early Holocene sites in the Alexander Archipelago located in 2009-2011 using a predictive model based on the age and elevation of relic raised marine beaches. These microblade and pebble tool sites range in age between 9,200 and 7,000 BP and are located on the former shoreline above the highest marine transgression dated to the same age. Results of continuing small scale excavation at the 2009/2010 sites will be discussed, as well as new sites discovered in 2012.

Carmody, Lydia (University of Tennessee)

[54] *Comparative Early Mississippian Subsistence in the Central Mississippi Valley*

New vertebrate faunal analysis of the Big Lake phase at the Zebree site (3MS20) has recently been completed. The data builds upon previous subsistence research within the Central Mississippi Valley by both Bruce Smith (1975) and J. Matthew Compton (2009). This paper seeks to compare subsistence patterns of the Early Mississippian Big Lake phase to other contemporaneous sites within the Central Mississippi Valley for a more fine-tuned comparative look at this transitional time frame.

Carmody, Stephen (University of Tennessee, Knoxville), Maria A. Caffrey (Ph.D., Dept. of Geography University of Tennessee), Sally P. Horn (Ph.D., Dept. of Geography University of Tennessee) and Belinda M. Lady (Dept. of Chemistry University of Tennessee, Knoxville)

[124] *Palynological and Chemical Analyses of Pipe Residues as Evidence for Prehistoric Tobacco Use in the Southeastern U.S.*

The prehistory of tobacco (*Nicotiana spp.*) in the New World has long interested anthropologists, geographers, and historians. Native Americans used several species of *Nicotiana* for both medicinal and ceremonial purposes. *Nicotiana rustica*, the most widespread species in prehistoric eastern North America, is an Andean hybrid that was transported to Central America and Mexico by 7000 BP, and reached the Mississippi Valley between 4000 and 3000 BP. Traditionally the identification of tobacco in archaeological contexts has been limited to small, carbonized seeds that measure between 0.5 to 1.1 millimeters. Additional evidence comes from analyses of pollen and other components in pipe residues. Here we describe our efforts to build upon the previous work of Hall (unpublished) and Rafferty (2002) by searching for pollen and chemical evidence of tobacco in pipes from archaeological sites in Georgia, North Carolina, and Tennessee. We found sufficient pipe residue for analysis in several pipes dating from before 2000 to 500 BP. Samples were prepared using conventional palynological and gas chromatography / mass spectrometry (GC/MS) techniques. Results of these techniques contribute to ongoing investigations into the transmission, use, and customs surrounding tobacco and the smoking culture in eastern North America.

Caromano, Caroline and Rui Sergio Sereni Murrieta (Universidade de São Paulo - Instituto de Biociênci)

[50] *Fire in Precolonial Amazon: Some First Thoughts on Its Use as Technology and Its Possible Past Roles under Material Culture Theory*

In the Amazon, fire possesses an important role for thousands of modern communities, present from the interior of houses to agricultural fields, and it is hypothesized that its importance in the precolonial past would have been even greater. Research conducted in the region point to the importance of anthropic fire in the history of people and the forest itself, being a common element in traditional agriculture and responsible for changes in ecosystems and soil productivity. In archaeological sites, evidences of fire are frequently identified, pointing to its use in the undertaking of widely various past activities. Past anthropic fire is frequently viewed solely under its technological aspects, and little attention is given to the existence of symbolic values behind its production. Under material culture theory, anthropic fire may be interpreted as a 'thing' possessing agency in social relations, ambiguous in nature as a natural phenomenon produced by humans and, therefore, also cultural in its essence. Due to the impermanence of fire in archaeological sites, Ethnoarchaeology may be a privileged field of study, allowing the observation of present human-fire relations and the proposal of hypothesis and inferences for the analysis of direct and indirect archaeological vestiges of fire in the past.

Carpenter, John (Centro INAH Sonora) and Guadalupe Sanchez Miranda (Museo de Sonora)

[126] *Proyecto Arqueológico Norte de Sinaloa: Archaeological Investigations in Northern Sinaloa/Southern Sonora 2004-2011*

This paper summarizes the major accomplishments of our research in northern Sinaloa and southern Sonora carried out between 2004 and 2011. These archaeological investigations included regional reconnaissance, documenting artifact collections curated by community museums, cataloguing petroglyph sites, conducting systematic surveys, testing and extensive excavations. Preliminary observations regarding the archaeological traditions, cultural affiliations, the distribution of funerary mounds and

regional interaction and integration on the West Mexican/Mesoamerican frontier are also presented.

Carpenter, Scott [150] see Fisher, Philip

Carpenter, Alan (Hawaii State Parks)

[164] *Why Nu'alolo Kai? Archaeological Stewardship and Cultural Revitalization on Kaua'i's Remote Napali Coast, Hawaiian Islands*

Nu'alolo Kai, a small rocky shoreline and reef flat within Napali Coast State Wilderness Park on the northwest shore of the island of Kaua'i, has been the focus of an archaeological stewardship program since 1996. Nu'alolo's remote and difficult to access situation make it a very unlikely candidate for such an initiative, yet its unique array of sites and spectacular setting have continually drawn volunteers to toil in the hope of preserving this small piece of Hawai'i's traditional past. This presentation will reflect on this unique success story which has spanned the better part of two decades. It will focus on how the collaborative effort has evolved from humble beginnings, motivated by scientific inquiry and consisting primarily of detailed documentation of something ancient, into an endeavor driven by a vibrant host culture seeking revitalization of a once static complex – resulting in the creation of a living, breathing source of inspiration and contemporary significance.

Carranza Melgar, Fernando [286] see Klaus, Haagen

Carr-Locke, Sarah (Simon Fraser University / IPinCH)

[262] *What Can Museums Learn from Indigenous Archaeology? Seeking an Identity for Collaborative Indigenous Methodologies In Museums*

Since its inception in the late 1990s, Indigenous archaeology has been acknowledged as an established theoretical, methodological framework and. Recent initiatives such as the Intellectual Property Issues in Cultural Heritage (IPinCH) project expand the preuve of Indigenous archaeology to include a critical examination of Indigenous involvement in heritage management as a whole, including consideration of how culture is displayed and managed in museums. While the ongoing development of Indigenous archaeology demonstrates how Indigenous knowledge and academic practice can create new methods and practices for mutual benefit, a survey of museum literature reveals that no similar unified body of theory and practice has been created that addresses these concerns despite multiple examples of collaborative relationships within public and tribal cultural institutions. Is it possible to identify an "Indigenous Museology"? How in turn might this affect and reflect larger developments in Indigenous heritage management? In this paper, I ask to what extent greater involvement of and consultation with Indigenous peoples is changing museum practice and what similarities exist with the goals and methods of Indigenous archaeology.

Carson, Mike (Australian National University)

[233] *Paleo-Terrain and Site Discovery in Pacific Islands Archaeology*

For several Pacific Islands case studies, integrated natural-cultural history sequences have been possible by combining computer-generated paleo-terrain models with site-specific geoarchaeological testing. A detailed example is illustrated for a 3500-year record in the Mariana Islands. The results have transformed the ability to find ancient sites, to date them accurately, and to situate them in their original contexts. The same approach can be applied in other settings to improve programs of site-discovery and interpretation of ancient site settings and ecology.

Carter, Tristan [32] see Sadvari, Joshua

Carter, Tristan (McMaster University), Nerissa Russell (Cornell University), Scott Haddow (Çatalhöyük Research Project), Amy Bogaard (Oxford University) and Christina Tsoraki-Chan (Sheffield University)

[32] *Laying the Foundations: Creating Households at Neolithic Çatalhöyük*

Building a house that will be occupied for decades - often following its predecessor's destruction - is a highly charged liminal moment that likely coincided with the foundation of a new or reconfigured household in need of establishing its social identity and standing. The practices associated with constructing a house at Neolithic Çatalhöyük thus marked a defining moment in the creation of particular social entities and the establishment and/or continuation of a lineage. We have recognized the remains of a series of repeated practices within the construction and/or first occupation phase of many buildings, including obsidian caching, the manufacture and gifting of projectiles, the burial of neonates, stone and wood-working, plus the deposition of various special faunal and archaeobotanical assemblages that are viewed as 'foundational' in nature. We argue that these deposits provided a spiritual endowment and social capital to ensure the long-term success of the house and its occupants. We explore the various acts that needed to be performed, the media articulated within them, and the nature of the networks that had to be re-affirmed and created anew in order to endow the Çatalhöyük house and establish its social foundations.

Carter, Fawn (University of Alaska Museum of the North) and Christopher Houlette (Gates of the Arctic National Park and Preserve)

[168] *Revisiting Kukulik: A Languishing Collection Meets Modern Methodology*

In the 1930s archaeologists collected thousands of artifacts representing roughly two millennia of continual occupation at the abandoned Yupik Eskimo site of Kukulik, on St. Lawrence Island, Alaska. These collections are housed at the University of Alaska Museum of the North and have been largely disregarded for over seventy years. The Kukulik collections were in dire need of better management, but that management had to be meaningful from a research perspective. This required an understanding of the collectors' intent and consideration of the structure of the collections in their original form. Purposeful stabilization and re-housing of the numerous and varied objects was achieved through a combination of creative archival methods, research of archival documentation, and rediscovery of legacy data. Consequently these efforts have opened the door to more robust inter- and intra-site analyses leading to a re-visitation of some of the initial interpretations of this site. This paper discusses the process of applying modern standards to a languishing collection with the goal of making it more accessible and research friendly.

Carter, Alison (University of Wisconsin-Madison)

[249] *The Production of Stone Beads in Southeast Asia*

Agate and carnelian beads, likely imported from South Asia, and found across Southeast Asia have been the focus of numerous studies in recent years (e.g. Bellina 2007; Theunissen 2003). However, Southeast Asia also had a local stone beadmaking tradition that was thriving before and during contact with South Asia. In this paper, I explore these Southeast Asian stone beadmaking traditions in more depth. I begin with a review of evidence for stone bead production and a discussion of the different types of stone beads produced. I then discuss the results of an examination of impressions of bead perforations from several different Southeast Asian stone beads using a Scanning Electron Microscope (SEM). Using SEM to examine these perforations allows for a more detailed view of the scars left during the drilling process and can be related to specific drilling

techniques. Lastly, I discuss the results of an experimental study in which garnet was drilled using a variety of different drilling techniques. This experimental study provides valuable information regarding the different methods used by Southeast Asian stone beadmakers, and the skill and effort needed to produce these beads.

[216] *Discussant*

[249] *Chair*

Carter, Nicholas (Brown University)

[239] *The Ajaw in Society: Terminal Classic Maya Representations and Practices of Inequality*

Inequality is fundamental to political complexity, yet the polity as representation--the "state," "kingdom," or "nation"--necessarily obscures the nature of that inequality in practice. Archaeological and historical studies of past periods when political hierarchies unraveled offer insight into the construction, reproduction, and contestation of sociopolitical inequality as distinct from offices and institutions. This paper presents the preliminary results of research into the semiotic and material cultural dimensions of inequality during the Terminal Classic period (ca. A.D. 800-1000) in the southern Maya Lowlands. A spatiotemporal distributional study of iconographic and textual themes on carved monuments reveals trends and commonalities in how Terminal Classic elites represented themselves. Archaeological data, including from excavations at the site of El Zoz, Guatemala, shed light on the material correlates and embodied practices of inequality during the Maya "collapse."

[239] *Chair*

Caruso, Annie [2] see Giovas, Christina

Casar, Isabel (Instituto de Fisica UNAM), Isabel Casar (Instituto de Física, Universidad Nacional Autónoma), Edith Cienfuegos (Instituto de Geología, Universidad Nacional Autónoma), Pedro Morales (Instituto de Geología, Universidad Nacional Autónoma) and Linda Manzanilla (Instituto de Investigaciones Antropológicas, UNAM)

[17] *Carbon and Nitrogen Isotopic Ratios of Tooth Collagen andapatite in the Reconstruction of Human Diet in Teopancazco Teotihuacan, Mexico*

The reconstruction of the diet of the population working in Teopancazco, was performed using the isotopic composition of carbon, nitrogen and oxygen of teeth (collagen andapatite) from human remains and archaeological fauna. Also isotopic analyses of tissues from modern fauna and flora from the site were conducted. The combined use of the isotopic data allowed us to distinguish between diets of a local population and specific diets from special burials or those of different geographical locations. The botanical and marine origins, trophic levels and protein sources of the Classic period diets were identified with the $\delta^{13}\text{CVPDB}$ and the $\delta^{15}\text{NAIR}$ of the collagen and using the carbon isotopic model of $\delta^{13}\text{CCollagen}$ and $\delta^{13}\text{Capatite}$. Finally the association of a C4-C4 diet to a geographical local population moving towards a more complex dietary combination associated with immigrants and special burials was achieved with $\delta^{18}\text{Oapatite}$ and $\delta^{13}\text{Capatite}$.

Casar, Isabel [17] see Casar, Isabel

Casasola, Estuardo [21] see Rivera Castillo, Patricia

Cascon, Leandro and Rui Sérgio Sereni Murrieta (Universidade de São Paulo - Instituto de Biociênci)

[103] *Deep Roots: Discussing the Role of the Concept of Root-Crop Agriculture in Amazonian Precolonial archaeology*

Root-crop agriculture, especially in the form of Manihot cultivation, has traditionally been postulated as having an important, if not vital, role for groups throughout the Amazon basin in precolonial periods. However, the discussion on pre-colonial Amazonian diet has also traditionally suffered from a great absence of direct archaeological evidence on plant use, such as analyses of botanical remains. Over the last decades, archaeobotanical research has slowly but ever-increasingly provided a new set of data regarding past diet in the region. Such studies present data which at times seem to contrast with established concepts on precolonial Amazonian diet, pointing to great dietary diversity in contexts thought to be dominated by staple-crops such as Manihot, as well as pointing to flaws in the automatic correlating of artifacts such as griddles and grater flakes to Manihot consumption. In light of such new evidence, the present work intends on analyzing the concept of root-crop (and especially Manihot) agriculture in Amazonian archaeology, how such generalized opinion may be viewed as the result of a historical construct based on diverse trains of thought, each valid but perhaps unable to sufficiently characterize the diversity of diet in the pre-colonial Amazonian basin as a whole.

Case, D. Troy [41] see Offenbecker, Adrienne

Case, Dana

[108] *A Description of the Artifacts Recovered on the Patio of Pyramid 3 and the Conclusions That Can Be Drawn from These Findings.*

For four weeks during 2012, the students from the first session at the Archaeology field school of the Instituto de Estudios Peruano conducted excavations on the patio of Pyramid 3 in Panquima. The goal of this project, as stated on the IEP field school website, was to "understand the political, economic, and ideological factors that acted in the development of this region during pre-Hispanic times."

During Session I, three units were opened at Panquima, including one unit on the patio of Pyramid 3. Various artifacts were recovered, including food remains (corn, peanuts, small animal and fish remains, and carbon samples), lithics, textile fragments, pottery sherds and other ceramics, pieces of spondylus shell, and a single copper needle. The artifacts had been discarded, which indicates that Pyramid 3 was used as a trash dump before Panquima's abandonment. These artifacts were also able to answer some of our questions about the day-to-day life of the people living there. They gave us information about the foods and other goods (such as textiles, pottery, and religious artifacts) that these people were producing. The artifacts also confirmed that Panquima was abandoned before the arrival of European settlers, as no European artifacts were found.

Case, Robert

[277] *Kumeyaay Responses to the Euroamerican Intrusion in Coastal San Diego: Alternatives to Retreat*

Recent fieldwork in Old Town San Diego State Historic Park encountered relatively high frequencies of ceramics typical of the precontact Kumeyaay Brownware tradition. The virtual absence of flaked lithics, however, suggested a postcontact historic context. This paper first examines the nature and context of the Brownware ceramic assemblage recovered during the Fiesta de Reyes Remodeling Project. This is subsequently compared to documented assemblages from the Royal Presidio of San Diego and Mission San Diego de Alcalá. The differences displayed between these collections hints at the different strategies at play as Kumeyaay and Euroamericans forged a colonial frontier society. The documentation of this process in the form of Mexican and United States census records helps to fill in gaps in the archaeological record and allows a tentative reconstruction of how this process may have worked. The paper concludes with potential avenues for future research into the formation and maintenance of

Alta California frontier societies.

Cases, Juan Ignacio (SUNY at Albany / Sociedad Española de Estudios Mayas)

[166] *A Sky of Jewels: Cosmographic Elements in the Context of Classic Maya Lunar Series*

Classic Maya Lunar Series are glyptic sentences providing information about the lunar calendar, and are relatively frequent in calendrical contexts in Classic Maya inscriptions. While recent decipherments have shown that one of the specific constituent glyphs of these sentences refers to the name of the lunation, many important questions about the classification, origin, and function of those constituents are yet to be addressed. In this contribution, using linguistic, epigraphic and iconographic sources from the Classic to the Colonial Period, several of these elements are analyzed. Specifically, this approach considers recent advances in epigraphy that have lent valuable insight of several myths in Maya cosmogony involving certain cosmographic elements, now interpreted as metaphorical references to jewels. The concepts of the sky and their relation to mythological creatures adorning the astronomical landscape as jewels are discussed.

Cassiodoro, Gisela [148] see Belardi, Juan

Castaneda, Francisco [65] see Navarro-Farr, Olivia

Castanzo, Ronald (University of Baltimore)

[126] *The Identification of Ceramic Production and Exchange in Archaeological Contexts: A Multifaceted Approach*

Five features consisting of subterranean, generally trunco-conical spaces, were excavated in 2007 on Cerro Tlaquexpa, near San Felipe Tenextepetec in central Valley of Puebla, Mexico. Excavated contexts date to the Late Formative Period. In the identification and characterization of pottery manufacturing and exchange at the site, four types of evidence were used: morphology of the features, the nature of the artifact assemblage, degree of product standardization, and chemical profiles of pastes. The walls of these features (largely dug out of the tepetate substrate) were heavily oxidized, reddish-orange; the floors were carbonized, gray to black. Numerous examples of wasters, tools used in clay preparation, and other evidence of ceramic production were recovered; a high proportion of red-slipped subhemispherical bowls in the artifact assemblage suggests a focus on a single ware. Product standardization, while low, falls within the range of household-level production. INAA reveals significant differences in chemical profile between the pastes of vessels recovered at the site and those obtained in a regional survey conducted in the 1990s. Findings strongly suggest pottery manufacturing for exchange by the families of Cerro Tlaquexpa and that their product was traded throughout much of the region.

Castillo, Mario (California State University, Dominguez Hills)

[121] *A Taphonomic Approach to Migrant Stations: Excavating Cultural and Natural Site Formation Processes in the Sonoran Desert*

Each year thousands of undocumented migrants attempt to enter the U.S. by walking across the Sonoran Desert of Southern Arizona. Along the way people eat, rest, and deposit a variety of objects (e.g., water bottles, clothes) at temporary camp sites known as migrant stations. These contemporary archaeological sites are affected by cultural and natural formation processes which include the re-use of deposited materials by other migrants, removal of items by non-migrants (e.g., environmentalists, humanitarian groups, political artists) and environmental factors such as water flow. In the summer of 2012, I designed a taphonomic study to examine how wind and water impact migrant stations. I found that alluvial and aeolian formation processes

increase the rate of artifact decay and destruction while simultaneously changing the spatial distribution of objects. Here I present some of this taphonomic data and argue that understanding how artifacts are impacted by both human and natural processes provides useful information for archaeologists interested in studying the physical (and ephemeral) process of migration. Moreover, I posit that a taphonomic approach allows for a better understanding of how border crossing (and the material culture associated with it) is actively erased, appropriated, and re-imagined by human and non-human actors.

Castillo, Victor [160] see Vargas, Leticia

Catherine, Hänni [20] see Ollivier, Morgane

Cauchois, Hinanui (University of Hawaii at Manoa)

[274] *Subsistence Systems and Defensive Strategies in Precontact Mo'orea and the Society Islands*

This paper presents the results of 8 years archaeological research project examining the dynamic relations between inland settlements, resource use, and defensive strategies in precontact Mo'orea, Society Islands. It encompasses a broader survey that compared this region of Papetoai with other valley systems in the Society Islands. It integrates archaeological data, oral traditions, ethnohistoric sources and a GIS-based analysis of the Tahitian cultural landscape and applies towards understanding a topic that has largely been overlooked in French Polynesia. This research broadens our knowledge concerning contemporary issues regarding the timing of resource use and intensification, competition and conflict, and the distribution of human groups across the landscape of Mo'orea and the Society Islands

Caval, Saša [221] see Seetah, Krish

Cavero, Yuri [33] see Kimber, Tom

Cavero , Yuri [220] see Lau, Michelle

Cazares, Irma (Zona Arqueologica de Monte Albán, INAH)

[159] *Pesquisas descubiertas, a propósito de la Tumba 7*

El hallazgo de la Tumba 7, a partir de las exploraciones realizadas por Alfonso Caso en Monte Albán, generó un cúmulo de información, concentrada en notas personales, imágenes, dibujos, mapas y/o planos que actualmente conforman los dos Fondos Alfonso Caso, ubicados tanto en la Biblioteca del Museo Nacional de Antropología del INAH, como en el Instituto de Investigaciones Antropológicas de la UNAM. Revisar estos dos acervos, y otros más, en busca de material inédito, que contribuyera a la ampliación de la información hasta ahora conocida sobre la Tumba 7, no ha sido tarea fácil. He aquí una muestra de nuestras indagaciones.

Cecil, Leslie (Stephen F. Austin State University)

[57] *Souls of the Ancestors: Postclassic Maya Incensarios and Mana*

Pottery style is as much what is added on to the surface as it is the technological acts of manufacture. Surface decorative treatments have a wide variety of meanings. Some are purely aesthetic, some are functional, and some are symbolic. One of the most functionally and symbolically decorated pottery categories in the Postclassic period of the Maya area are effigy incensarios. Full-figure effigy incensarios depict various deities or humans and are attached to pedestal base vases used to burn resins and are most often excavated from ritual contexts.

In addition to the obvious stylistic features of the effigy incensarios, when one examines the manufacturing process of vessels, often there is more than what is added on to the surface that conveys meaning. A petrographic analysis of incensarios from Petén, Guatemala suggests that a specific temper type from an earlier time period (volcanic ash tempered grog) was added to some of the effigy incensarios. While other Postclassic vessels were occasionally tempered with this kind of grog, no other effigy incensarios were. Was this temper added to imbue the vessels, and thereby the deities attached to the front of the vases, with the souls of the Maya ancestors?

Cecil, Leslie [140] see Levine, Marc

Cegielski, Wendy (Arizona State University)

[205]

Chiefdoms: An Agent-Based Model of Structural Elasticity, Inequality Formation, and Currency and Power Dynamics

This analysis uses Agent-Based Modeling (ABM) and scale-free stochastic network analysis to circumvent issues associated with static typologies by reformulating the study of chiefdoms in terms of a dynamic, social lab exploring the connectivity of actors across social scales, structural changes, flows of power and wealth within a chiefdom, and the processes of inequality formation. More specifically, this research under particular parameters shows how chiefdoms as systems survive even when a particular leader fails, how certain actors may build up power and currency, how power and currency interact to produce inequality, and under what conditions chiefly power exhibits cycling.

Cerezo-Roman, Jessica (University of Arizona) and James Watson (University of Arizona, Arizona State Museum)

[286]

From Inhumation to Cremation: Changes in Funerary Rituals in Southern Arizona from the Early Agricultural to Preclassic Periods

A major change in funerary rituals occurred in Southern Arizona in the first millennium AD. The predominant mortuary rituals in the Early Agricultural period were inhumations characterized by extensive variation in body position and location, possibly emphasizing individuality. These rituals changed in the Preclassic period as cremation became the predominant practice. Cremations during this period were mainly secondary deposits with low quantities of bone located in cemeteries within courtyard groups. In these cremations particular aspects of individual intersecting identities were emphasized, such as group membership. In this paper we explore possible triggers for these changes by analyzing the biological profile of human skeletal remains and posthumous treatments of the bodies.

Cerezo-Román, Jessica I. [57] see Tsukamoto, Kenichiro

Ceron, Jasminda [7] see Moore, Jacy

Cesario, Grace (University of California, Davis)

[204]

Prehistoric Bone-Tool Production in Northwest Alaska

Prehistoric ancestors of the Iñupiat people lived at Cape Espenberg, on southern Kotzebue Sound, Alaska, in semi-subterranean houses with long entrance tunnels for about nine months of the year. At site KTZ-087, house feature 68A (ca. cal AD 1395-1635) was excavated in 2010, and the adjacent feature, 68B (ca. cal AD 1420-1630), was excavated in 2011. These two features are no more than two meters apart and share similarities in tunnel construction, dimensions, and orientation, suggesting contemporaneous occupation. Despite the similarities, however, the two houses are quite different in terms of use. The

amount of lithic, wood, and bone working debris in feature 68B is astonishing compared to the near lack of such debris in the adjacent house, 68A. Research was focused on understanding bone-tool production through the analysis of osseous debitage (bone, antler, and ivory) from both houses. In Feature 68A, 54 pieces of osseous debitage were recovered, whereas over 1900 pieces were recovered from Feature 68B. Both assemblages are dominated by antler debitage; however, the manufacturing techniques and stage of reduction vary between features. These results suggest that Feature 68A was a single family house while Feature 68B was a men's house (karigi) or a workshop area.

Chadwick, Oliver, Peter Vitousek (Stanford University) and Sara Hotchkiss (University of Wisconsin)

[255] *Farming the Rock: A Biogeochemical Perspective on Intensive Agriculture in Polynesia*

In this paper we examine Pacific Island intensive agriculture, a topic at the heart of Patrick Kirch's scholarship, from a biogeochemical perspective. Agriculture removes nutrients contained in harvested products from fields; the more productive the agriculture, the greater the removal of nutrients. The return flow of harvested nutrients from human systems to farm fields is incomplete and depletion can constrain intensive farming in just a few years. In the Hawaiian Islands, we find two major types of intensive agriculture: non-irrigated dryland and flooded-field irrigated farming. Large, intensive rainfed systems were developed in areas with relatively young substrates (<500,000 yrs) and moderate rainfall (750-1500 mm/yr) where weathering actively supplies nutrients to soils. Minerals that could weather are depleted in wetter or older areas, and the main supply of most nutrients comes from more dilute sources in rainfall. Flooded-field systems also derived nutrients from rock, but by a different pathway. Percolating water reached weathering rock deep below the ground surface; water then transported soluble rock-derived nutrients to streams and ultimately to irrigated fields. Cultivators in rainfed systems brought their crops to areas where rock was weathering and supplying nutrients, flowing water brought the products of weathering to crops in irrigated systems.

Chan, Evelyn [78] see Pugh, Timothy

Chandler, Tom (Monash University)

[104] *Modeling and Animating the Accounts of Zhou Daguan*

Being the only surviving eye witness description of Angkor as a fully functional medieval metropolis, the account of the 13th century Chinese emissary to Angkor, Zhou Daguan, is widely cited among scholars of Cambodian history and archaeology. The vivid written descriptions of architecture, society and events in Zhou's memoirs have been primary sources in the visual imagination of Angkor for historical illustrators, archaeological documentary directors and, recently, for 3D animators as well.

This paper overviews how the creation of 3D virtual models based on a range of archaeological, art historical, architectural, and cartographical research can be deployed against selected excerpts from Zhou's record of Angkor. Given that 3D animation is essentially a four-dimensional visualization tool (three spatial dimensions plus sequential time), it will be argued that it can be used to force certain historical and archaeological assumptions to be made more precise.

Chang, Michelle (Simon Fraser University)

[108] *Plant Species at the Site of Panquimla and*

How They Are Used Today in the Andes

The excavation of a storage facility in Panquimla's Pyramid 3 uncovered several different plant species. In this paper I would like to identify these different plant species, and then I will explore the role they play in the present day. The excellent conditions of preservation at this site will benefit the endeavor to identify the plants.

In order to identify the species, I will research what plants were prevalent during the Late Intermediate Period in the Andean region and then examine size, shape, color, and any other distinctive features regarding the plant specimens from the excavation. I will compile attributes of a certain specimen into a description and determine if it matches a specific species. Following this, I will address the current functions of these plants in the Andes.

Chang, Melanie Lee [217] see Nowell, April

Chapman, John and Bisserka Gaydarska (Durham University)

[15] *The Revolution in Tripillia Mega-Site Studies – The Example of Nebelivka*

The first 40 years of investigation of the Tripillia mega-sites were based upon three field techniques: aerial photography, magnetometry and excavation of individual structures. These methods gave an understanding of broad planning principles but also provided exaggerated site sizes, little detail on intra-site grouping and no indication of intra-site phasing. On the basis of these results, Fletcher characterized Tripillia mega-sites as the major world exception to his limit to agrarian settlement size.

In the last five years, a conceptual and methodological revolution has occurred, with high-precision magnetometry providing detailed plans of parts of four mega-sites. This has allowed a superficially improved understanding of mega-site planning through the identification of eight new elements:- internal ditches, paleo-channels, roads, regularly occurring household clusters, pit clusters, bounded unbuilt spaces and larger ensembles of houses, as well as mega-structures. These new elements reveal a far greater degree of internal spatial ordering than was ever detectable on the older plans.

However, this hard-won understanding will remain chronologically superficial until we construct the internal phasing of an entire mega-site, placing the newly defined intra-site zones into a secure AMS-based sequence. An example of a methodology for such internal phasing is given for the mega-site of Nebelivka.

Charles, Mona (Fort Lewis College) and Dawn Mulhern

[16] *Burial Context, Funerary Objects, and Chronology in the Basketmaker II Population from Durango, Colorado*

Death and burial among the Basketmaker II in the American Southwest are examined from the perspectives of burial context, funerary objects and chronology. The sample assemblage for this presentation includes burials from sheltered and non-sheltered Basketmaker II sites near Durango in Southwestern Colorado. The inclusion of both site types provides an opportunity to examine mummified and skeletonized burials along with perishable and non-perishable funerary objects. Furthermore, new chronometric dates obtained from refuse in the burial cists allow for temporal distinctions to be made about the burials. The types of burial goods suggest preferences for particular funerary objects between the sexes and between adults and sub-adults. Multiple burials, comingled burials and partial burials are present in the assemblage and often these burials appear represent reburials. There is some indication that these anomalous burials cluster toward the later end of the Basketmaker II occupation which coincides with the possibility that some of the burials could have been disturbed through prehistoric excavations. To a limited

extent, the results of our study are extended beyond the "Eastern" Basketmakers to those of the "Western" Basketmakers.

Charles, Mona [16] see Mulhern, Dawn

Charles, Douglas (Wesleyan University)

- [101] *Identity Differentiation during the Hopewell Phenomenon of the Eastern Woodlands of North America*

Following disruption of the Mississippi drainage floodplain ecosystems at the end of the Archaic period, ca. 3000-2600 B.P., Early Woodland populations abandoned these regions and dispersed in low densities across the interior Midwest. By around 2000 B.P., the floodplain ecosystems had stabilized and attained their modern form. Almost immediately, the dispersed communities began to return, and local population densities spiked in the relatively confined landscapes of the river valleys. This period of coalescence lasted from 300 to 500 years and is defined archaeologically as the Middle Woodland period, with a coterminous and ubiquitous, but unevenly distributed, material culture efflorescence known as Hopewell, in which earthwork construction, funerary elaboration, and exchange of exotic objects and materials served as the media through which new identities, communities, and relationships were forged among unrelated or only distantly unrelated individuals and lineages. The meanings of the objects, materials, symbols, and rituals would have been familiar to varying degrees, given that people shared a regional culture history, which facilitated a very rapid emergence of highly differentiated societies at various locations along the Mississippi, Illinois, Ohio, and Tennessee rivers and in south central Ohio. The paper will focus on the process and nature of this social differentiation.

Charlin, Judith [26] see Borrazzo, Karen

Chase, Arlen [62] see Brandt, Steven

Chataigner, Christine [226] see Varoutsikos, Bastien

Chatters, James C. [109] see Rissolo, Dominique

Chatters, James (Applied Paleoscience)

- [177] *Wild-Type Colonizers and High Levels of Violence among Paleoamericans*

Bioarchaeological analysis of pre-9000 cal BP human remains from North America has revealed an unusually high frequency of trauma among adults. In nearly 1/3 of all skeletons of older adolescents and adults, the type and location of those injuries are consistent with interpersonal violence. Projectile injuries and depressed skull fractures are particularly common among males; rib and forearm fractures occur among females. This pattern may have been the result of sexual and natural selection for aggressive males during the colonization of the continent, selection that was reversed when females gained greater control over their food supply during the Archaic and "domesticated" their mates.

Chavez, Juan [63] see Kabata, Shigeru

Chavez, Sergio

- [132] *Sacred Continuities from Yaya-Mama to Tiahuanaco on the Copacabana Peninsula*

Recent discoveries at the site of P'ajana Supullullu, on the Peruvian side of the Copacabana Peninsula on Lake Titicaca, show what appears to be a stone-lined semi-subterranean temple structure with a three meters long early Yaya-Mama style stone

sculpture situated in the middle of the sunken court. Directly associated with it were: at least one identical pair of Tiahuanaco style stone "chachapumas" (each kneeling and holding an axe and a severed human head), several anthropomorphic carved heads, stone tools (such as grinders, weights, hoes), and pottery fragments of Qalasasaya/Yaya-Mama and "Classic" Tiahuanaco styles in relative abundance. This is the second case (besides the temple at the site of Tiahuanaco) where a Yaya-Mama stela is reused and directly associated with Tiahuanaco. This site was extensively excavated by the local inhabitants of the community of P'ajana Supullullu, motivated by the possibility of generating a touristic attraction. Unfortunately, no professional archaeologists were consulted about this action, and it was after they had excavated the entire perimeter of the sunken court, that they informed the local representative of the National Institute of Archaeology. Subsequently, he contacted me and sought my presence to assess the damages, make an inventory, and study the materials.

Chaviara, Artemi (Marie Curie ESR Fellow – Narnia / Thetis Authentics, Ltd./ Athens Greece) and Eleni Aloupi-Siotis (Ph.D. An. Chem. / Thetis Authentics, Ltd./ Athens Greece)

- [178] *Attic Clay: Then and Now*

The work refers to a short, low-cost clay survey in Attica (Greece) undertaken by the authors in the frame of a research project on the production of decorated classical Athenian pottery. With a view to localize ferruginous illitic clay deposits for the production of the black glaze decoration of the vases, the survey made use of traditional methodology (geological maps, topography, ethnographic data) and benefited by easily accessible contemporary services (Google earth/maps). A limited number of well-scheduled land expeditions in two summer periods (June 2011 and July 2012) led to the collection of 35 clay samples from 26 sites which were processed in the laboratory to produce water suspensions (clay slips); the clay-paints were applied on clay bodies of different curvature and led to black glazed laboratory specimens following 3-stage ORO firings; the final products were tested and compared with ancient sherds from recent excavations in Attica in terms of their macroscopic, microscopic and chemical characteristics. This detailed multi-parameter assessment of raw materials and specimens allow us to nominate 4 sites on the NW-NE (Parnis), East (Mesogaia) and SE (Laurion) of Attica which are discussed in terms of their geographic relevance to the pottery production district of Athens (Kerameikos).

Cheetham, David (ASU), Clarus Backes (Sapphos Environmental), James Burton (University of Wisconsin-Madison), Michael D. Glascock (University of Missouri) and Hector Neff (California State University-Long Beach)

- [288] *Chemistry and Colonization: Gulf Olmec Signatures at Canton Corralito, Chiapas, Mexico*

Chemical analyses of Initial and Early Olmec period (1250-1150-1000bc, uncalibrated) ceramic materials from Canton Corralito, Chiapas, help to clarify diachronic aspects of ethnic identity and cultural interaction between this town-sized colony and its homeland polity of San Lorenzo, Veracruz. Relevant are NAA data, strontium isotopic and petrographic analyses of ceramic objects, and laser ablation of pigments. Our presentation summarizes these lines of data and situates them against current understandings of Gulf Olmec interaction within Mesoamerica. We stress the complementarity of chemical and non-chemical methods in deducing the nuances of human interaction over long distances.

Chen, Xingcan [66] see Liu, Li

Chen, Pochan (National Taiwan University)

- [249] *Making Salt among Rocks: The Reconstruction of Ancient Salt Production in Yangpu, Hainan Island, China*

The Yangpu salt production site is located in the Yangpu Economic Development District, northwest Hainan Island, China. The salt production history in this region can be traced at least to the Tang Dynasty (618-907 A.D.). People in Yangpu use very unique techniques for salt production. Along the rocky coast, they carve rocks into stone troughs in various shapes and size and introduce sea water for evaporation, which is very different from other salt evaporation field techniques in southeast coastal area in China. Today, we still can observe various facilities of salt troughs, brine ponds, filtering ponds, pipes, bridges and harvest yards in the seashore. In this presentation, I will reconstruct the salt production procedures according to the historical documents and archaeological features. This preliminary research can help us understand the salt production techniques in this region and also give us directions for later excavations of similar sites in the Hainan Island.

Chenault, Mark [16] see Deaver, William

Chenault, Mark

[85] *The Building Blocks of Southwestern Villages*

Examination of site structure in two core areas of the US Southwest reveals that comparable units of architecture and habitation space are evident. These "residence units" are called unit pueblos (or Prudden Units) in the Mesa Verde region of Colorado and courtyard groups in the Phoenix Basin Hohokam core in Arizona. Architectural evidence suggests that residence units were occupied by nuclear families and/or small extended families. Residence units were constructed in clusters to form larger groupings, multiples of which are found at village sites. Thus, residence units constituted the building blocks of Southwestern villages. Comparison of residence units and overall site structure in the two cores has implications for interpretations of social structure and complexity.

Chenault, Nicole (Humboldt State University), Sarah Nicole Boudreaux (Texas Tech University), Melanie Sparrow (Humboldt State University) and Ty Swavely (SWCA Environmental Consultants)

[213] *Necessary Control: Exploring the Manufacturing, Utilization and Control Methods of Natural and Artificial Water Management Features through Excavation Results of an Ancient Maya Site within the Dos Hombres to Gran Cacao Archaeology Project, Northwestern Belize.*

Water was the primary resource in which the livelihoods of all ancient Maya peoples depended. This report will address the recent findings through an evidential analysis of artifacts and features pertaining to the ways in which the Maya whom occupied the hinterlands of a larger power site, Dos Hombres, were able to gain control of natural watersheds. We are exploring how occupants may have utilized these catchments to the fullest potential through natural and artificial water management systems. Subsurface investigations from the 2011 and 2012 project field seasons have allowed our research group to postulate on how water was distributed among occupants of one residential group, which secondary or tertiary purposes these features may have been used, and what it can tell us about water control among other groups within the project area.

Cheng, Guoliang [66] see Li, Zhipeng

Cheng, Chieh-fu Jeff (Boston University) and Pochan Chen (National Taiwan University)

[84] *The Archaeological Study of Colonial Cultural Landscape in Japanese Period (1895-1945) of Taiwan*

In order to exploit resources in the mountain areas of Taiwan, the Japanese colonial government built many trails crosscut traditional territories of indigenous groups. Police stations were established along these mountain trails for the sake of monitoring local populations. Some stations served multiple functions, such as trading posts, educational facilities and health centers. Many were located in remote areas, where all the supply could only be shipped by manpower. Also, the weather was extreme in those areas, which made the maintenance of these trails and stations more challenging. However, even under such difficult environment, some police officers were demand to bring their wives and children from Japan and stay in the stations. This fact suggests that these police stations were not only served as military outpost of the empire but also as the representation colonial state's value. Our research considers Japanese mountain trails as cultural landscape that reflects the relationship between colonizer and colonized. Thus, though the examination of material cultures found in the remains of Japanese police station, we will be able to understand the dynamics between police officers and local people that were no recorded in the historical accounts.

Chenghwa, Tsang [95] see Cruz Berrocal, Maria

Cherry, John (Brown University)

[167] *Aegean and Caribbean Island Archaeologies: Problems and Opportunities for Comparative Analysis*

The participants in this session probably agree that islands are exceptionally interesting places, and that the comparative archaeology of island archipelagoes provides productive territory for general theory building. This paper offers some reflections from an archaeologist whose four decades of island archaeology have been focused primarily on the Aegean, but who is now working in the Lesser Antilles. These two island theaters may seem fair game for comparison, yet their archaeologies have developed in very different ways. Recognizably modern archaeology in the insular Aegean reaches back well over a century, whereas its Caribbean counterpart is much more recent, resulting in significant differences in the comprehensiveness of their databases. Radically different environments (e.g., the semi-arid maquis landscapes of the Aegean versus semi-tropical forest) have major consequences for artifact visibility and site detection; systematic, high-intensity surveys are far less common in the Caribbean. Disciplinary distinctions play a role too: much work in the Aegean is by archaeologists interested in documenting and explaining long-term island histories, and there is no counterpart for the sharp divide in the Caribbean between the fieldwork styles of anthropological prehistorians versus historical archaeologists. This paper considers the prospects for engagement in the face of such major differences.

Cherry, John [264] see Leppard, Thomas

Chhay, Rachna and David Brotherson

[7] *Utilitarian Ceramic Production Centers in the Angkor Empire: The Site of Kok Phnov and Phnom Krom, Siem Reap Province, Cambodia*

Khmer stoneware ceramics were produced and used widely from the 9th through 14th centuries CE. Locally manufactured earthenwares were also made and used, as were tradeware ceramics. Field investigations by the Greater Angkor Project in 2012 concentrated on two utilitarian ceramic production centers, one in the Angkorian core (Kok Phnov site) and one lying south of the core near the Tonle Sap lake (Phnom Krom). Analysis of high-fired earthenwares recovered from excavations at these two sites suggests similar manufacturing technologies, particularly in their glazing and firing regimes. Use of a lime-based glaze on earthenware ceramic production reflects influences from stoneware firing techniques, so, too, does evidence that these

potters used waster sherds to cover their high-fired earthenwares in kilns. This paper discusses the similarities and differences in their manufacture stages and makes comparisons with utilitarian ceramic recovered from another occupation site in the urban Angkor core.

Chhay, Rachna [104] see Stark, Miriam

Chiarulli, Beverly (Indiana University of Pennsylvania)

[257] *Using Archaeological Geophysics to Develop Student Professionalism*

The IUP MA in Applied Archaeology was designed to train students as professional archaeologists. Most of our graduates will be employed in the fields of cultural resource management, historic preservation, public archaeology, or heritage planning and tourism. In these settings, critical skills like teamwork, public engagement, and communication will be as important as archaeological knowledge and skills. One of the courses that students can take to develop these skills is Specialized Methods in Archaeology, which is taught each semester and rotates between topical courses in Archaeological Geophysics, Zooarchaeology, Historic Artifact Analysis, and Prehistoric Artifact Analysis. This paper describes one of those courses, Archaeological Geophysics. The goal of the course is to provide students with an opportunity to work with new technologies as well as develop professional skills. Student teams plan and conduct geophysical surveys for outside "clients" like the Archaeological Conservancy, US Army Corps of Engineers, Indiana County Trails and Parks Department, local archaeological and historic societies, and community organizations. Student groups develop proposals, in some cases apply for ARPA permits, and prepare reports and conference presentations. This paper provides an overview of the course and discusses the strengths and weaknesses of this approach.

[118] *Discussant*

Chiarulli, Beverly [187] see Smeltzer, Marion

Chicoine, David (Louisiana State University)

[236] *Shellfish Resources and Maritime Economy at Caylán*

This poster explores the relationships between mollusk exploitation and maritime economies in ancient coastal Peru. Data are drawn from the analysis of shell remains from the Early Horizon center of Caylán (800-1 cal B.C.E.), a large urban settlement interpreted as the primary center of a multi-tiered polity located in the Nepeña Valley, coastal Ancash. Excavations in 2009 and 2010 have yielded a representative amount of faunal remains including 220 kg of shell remains for more than 100,000 MNI. Taxonomic and quantitative analyses of the shell remains bring insights into patterns of exploitation, consumption, discard, and ritual use. Results indicate an emphasis on locally available mollusk species linked to the exploitation of different near-shore and coastal settings. The sample is dominated by small clams and mussels pertaining to the *Donax* sp., *Perumytilus* sp., and *Semimytilus* sp. taxa. Intrasite distributions argue for social differences associated with the access to certain species used in maritime industries. Broader comparative perspectives from the Andean coast indicate variations in maritime subsistence strategies linked to the development of different forms of socioeconomic interactions and redistributive systems through time.

[236] *Chair*

Chicoine, David [236] see Clement, Beverly

Chicone, Sarah (Johns Hopkins University)

[100]

Toward Archaeological Analysis of Poverty: A Consideration of Impacts

This paper considers the utility of poverty as a category of archaeological analysis beyond historic contexts. There are dominant ideas that frame modern characterizations of poverty in regard to behavior, possessions, and access—and while these ideas impact contemporary discourse and public policy, they also get projected onto the past. Similarly, historical narratives of poverty play a formative role in shaping contemporary ideologies. Taking the events of the 1913-14 Southern Colorado Coal Strike, and the archaeological analysis of basic necessities including food, clothing, and shelter, this paper explores the influence existing manifestations of poverty have on the way we frame the past, as well as the way that past manifestations of poverty influence our awareness of the present. In so doing, it questions the utility of poverty as a category of archaeological analysis beyond historic contexts.

Chilton, Elizabeth (UMass Amherst)

[257] *Discussant*

[72] *Chair*

Chilton, Elizabeth [207] see Doucette, Dianna

Chineiwicz, Erin (Humboldt State University)

[207] *The Effects of Sea-Level Rise on Coastal Archaeology, A Case Study: Tolowa Dunes State Park, Del Norte County, CA*

By the year 2100, the California coast is expected to see an average sea-level rise of 1.4 meters above the 100-year flood zone. This rate is eight times faster than average sea-level rise over the last century. By using mapping technology, I was able to calculate inundation rates and the acreage lost at Tolowa Dunes State Park (TDSP) in northern California. California State Parks Department manages over 300 miles of coastline and as Executive Order S-13-08, is responsible for assessing sea-level scenarios. The Department has worked with a variety of research groups to draft guidance documents for vulnerable locations within park boundaries, such as TDSP which is 'Highly Vulnerable'. I examine the different sea-level rise scenarios at TDSP and how the expected rise will affect known sites and traditional ecology, while providing new information as the dunes erode away.

Chinique de Armas, Yadira [254] see Buhay, Bill

Chinique des Armas, Yadira [254] see Roksandic, Mirjana

Chiou, Katherine (University of California, Berkeley), Christine Hastorf (University of California, Berkeley) and Tom Dillehay (Vanderbilt University)

[103] *Early Evidence for Capsicum spp. at the Preceramic Sites of Huaca Prieta and Paredones, Chicama Valley, Peru*

The chile pepper (*Capsicum* spp.), thought to have been domesticated in highland Bolivia, has a long history of cultivation and use in the central Andes of South America. Though identification of chile pepper species through fruit morphology is possible, species-level identification of *Capsicum* seeds has remained uncertain. This project adopts a morphometric approach in comparing attributes of modern *Capsicum* seeds to archaeological seeds recovered during excavations from various temporal phases at the Preceramic sites of Huaca Prieta and Paredones (~7500-4000 B.P.) in coastal Peru. Not only do we find that species-level seed identification of *Capsicum* through attribute analysis is possible, our evidence suggests that the people who occupied Huaca Prieta and Paredones in the Preceramic period consumed several species of *Capsicum* early on before developing a particular taste for *Capsicum baccatum* in the Late

Preceramic.

Chiou-Peng, TzeHuey (Univ. Illinois UC)

- [216] *The Emergence of Copper-base Metallurgy in Prehistoric Southeast Asia: Current Studies and Issues*

Since the discovery of the Ban Chiang site (northeastern Thailand) several decades ago, a variety of models have been established to interpret the onset and evolution of pre-historic metallurgy in mainland Southeast Asia, where the first copper-base metal production already appeared in fully developed form. Recent data point to one or several outside sources in eastern Eurasia as inspiring the use of copper-base metallurgy near the Ban Chiang region, but which of the various routes of transmission and chronological schemes proposed so far is likely correct still remains a point of contention. Using archaeological and technical data from the 2nd and early 1st millennia BCE sites in Eurasian steppe, China, and Southeast Asia, this work reviews current studies on the beginnings of Southeast Asian metallurgy and examines related issues.

Chiu, Scarlett (Academia Sinica, Taiwan), David Killick (University of Arizona, USA), Christophe Sand (Institute of Archaeology of New Caledonia and the Pacific), Michael D. Glascock (University of Missouri Research Reactor (MURR), US) and Yuh-chang Sun (National Tsing Hua University, Taiwan)

- [181] *Exchange Spheres Identified by Using Both Chemical Compositional and Petrographic Analysis: A Case Study from Six Lapita Sites of New Caledonia*

The first available high-resolution elemental data on six New Caledonian Lapita pottery assemblages obtained via Instrumental Neutron Activation Analysis (INAA), Inductively Coupled Plasma-Mass Spectrometry (ICP-MS), and inductively coupled plasma atomic emission spectrometry (ICP-AES) are presented in this paper. Our results show evidence of strong correlation between specific geological zones and geochemical compositions of Lapita pottery within the islands of New Caledonia. Furthermore, by identifying sets of key index minerals and locating possible origins of their parent rocks, we are able to narrow down the possible raw material procurement areas to several possible river valleys along the island coast. This paper provides a valuable lesson for future investigations into the transportation of pottery within New Caledonia. It not only enables archaeologists to identify new exchange spheres among islands of New Caledonia, but also points out possible Lapita pottery production or raw material procurement locations which are unknown to local archaeologists before.

Cho, Helen (Davidson College)

- [38] *Histological Age Estimation of Archaeological and Diagenetic Bone*

Due to fragmentation and destruction of skeletal features, employing standard osteological methods to estimate the age-at-death of archaeological human remains is often challenging. Bone histology, the study of skeletal tissue through microscopy, utilizes small samples and has useful applications in bioarchaeology including age-at-death estimation, discriminating human and non-human bone, etc. Various histological age estimation techniques exist for different postcranial skeletal elements. However, diagenetic changes in the skeletal remains from the archaeological sediment can hinder the process of examining and quantifying bony microstructures for age estimation. I will present the results of a novel approach to quantifying bone microstructures for histological age estimation of skeletal remains with diagenesis. The study sample consists of femoral midshaft sections from the Isola Sacra necropolis near Rome (AD 2nd–3rd centuries). The skeletal sample is ideal for the present research as age-at-death estimates based on standard osteological methods exist for the

Isola Sacra individuals and many individuals exhibit bone diagenesis.

Choi, Jeong-heon [224] see Wright, David

Choyke, Alice [227] see Duffy, Paul

Choyke, Alice (Central European University, Hungary)

- [248] *Chair*

Christen, Kimberly (Washington State University) and Kimberly Christen (WSU/ Mukurtu)

- [105] *Mukurtu CMS: Grassroots Information Management Tool*

Archaeologists have a stake in digital preservation; however, mainstream content management tools do not reflect the dynamic terrain of the field and the many source communities with whom archaeologists have strong ties. While digital preservation has become a necessity for both archaeologists and indigenous communities, the standard options require the erasure of cultural and social mores for technological solutions. Mukurtu CMS, however, is built from the ground up to addresses the specific concerns of indigenous libraries, archives and museums and the diverse digital collections they manage and seek to preserve. Mukurtu CMS is a free and open source content management solution allowing communities to preserve, share, manage, license and curate their digital heritage. Mukurtu allows users to manage their digital heritage materials using international standards as well as their own local cultural protocols. This unique intersection provides indigenous communities with both a stable and upgradable tool to manage and share their digital assets and a platform for preservation and growth of their distinctive materials. Mukurtu promotes a community approach to digital heritage management and preservation extending the already embedded social and cultural systems of indigenous communities to their technological tools.

Christen, Kimberly [105] see Christen, Kimberly

Christensen, Alexander and Joseph Hefner (Joint POW/MIA Accounting Command)

- [190] *Clandestine Burials of U.S. Personnel in Dien Ban District, Vietnam*

In March 1965 the first US combat troops in Vietnam landed in Danang. From then until the withdrawal of US combat troops from the country in 1973, it was one of the primary centers of U.S. military strength. Dien Ban district is located along the coast of Quang Nam province, immediately to the south of Danang. Despite its proximity to the city, it was a hotbed of the Vietcong insurgency, which routinely ambushed U.S. troops. Several Americans were taken prisoner and removed from the area, while others were killed. Because of the presence of US and South Vietnamese forces, the bodies of ambush victims were buried in a covert manner. Over the past twenty years, joint US-Vietnamese teams have investigated at least eleven cases of missing personnel in Dien Ban, interviewing Vietnamese personnel involved in the ambushes and subsequent burials and excavating the locations indicated. The remains of missing US servicemembers have been recovered from some, but not all, of these sites. We consider the patterns evident across these clandestine burial cases and what lessons might be drawn from them for the recovery of similar cases in Vietnam and elsewhere in the world.

Christensen, Carl (Bishop Museum, Honolulu, Hawaii)

- [255] *The Archaeology of Cryptogenic and*

Prehistorically Translocated Freshwater Mollusks in the Hawaiian Islands

The majority (>90%) of the ca. 800 taxa of nonmarine mollusks recorded from the Hawaiian Islands are endemic. Most of the remainder are aliens introduced following first European contact in AD 1778. It has been suggested that ca. four species of land snails, three species of freshwater snails, and two species of freshwater clams that occur in Hawaii as well as elsewhere were inadvertently translocated here by Polynesian voyagers prior to AD 1778, although most of these are cryptogenic in that their status as native or introduced has been uncertain. Recent archaeological and paleoenvironmental studies clarify their status. Among the freshwater snails, *Melanoides tuberculata* (Müller, 1774), and *Thiara granifera* (Lamarck, 1816) (Family Thiaridae), are probably Polynesian translocations, although their absence from Hawaii prior to human settlement has not been conclusively demonstrated. *Tryonia porrecta* (Mighels, 1845) (Cochliopidae) is present in sites on Kauai antedating human settlement and should be regarded as indigenous; it undoubtedly reached Hawaii as a result of natural passive transport by waterfowl migrating from North America. The two freshwater clams, *Musculium partumeium* (Say, 1822) and *Pisidium casertanum* (Poli, 1791) (Sphaeriidae), lack any archaeological or paleoenvironmental record in Hawaii and are probably modern introductions.

Christie, Jessica (East Carolina University)

[61] *Rituals of Keeping and Controlling Time: The Cases of Chankillo and the Inka*
Solar observation in order to time the seasons and schedule subsistence activities has always been a vital concern in agricultural societies. As economic surpluses accumulated, increasingly complex infrastructure was devised to track and ritually control time by elite social groups and emerging leaders. This paper will discuss the horizon towers and associated observation points at the north-central coast site of Chankillo (c. 300 B.C.E.) in the Casma-Sechin river basin and at Cusco and other Inka sites. At Chankillo, a fortified temple from which battles were fought, thirteen towers and associated building complexes have been investigated. In Cusco, on the Island of the Sun, and at some royal estates, the movements of the sun were tracked from stony places in plazas as it rose and set between towers dotting the horizon line. By analyzing and weighting the material data and expanding to ethnography available for the Inka, this paper will discuss heterarchies in both societies and view solar observations as rituals of social incorporation. While the material for Chankillo is highly complex, this comparison with the Inka suggests that the people in the Casma-Sechin Valley followed a local social evolutionary trajectory which did not lead to statehood.

Christie, Shaheen (University of Wisconsin-Milwaukee)

[96] *An Archaeological Investigation of the Institution of Mithraism in Roman Londinium*
Contrary to previous interpretations of the Mithraic cult, there is evidence to suggest that relationships between cult members were linked both inside and outside the mithraeum. Through performances, both elite and non-elite members reinforced institutionalized relationships that operated in the wider transformations taking place after the Roman Conquest of Londinium. Through the use of social theory – specifically the areas of agency, meaningful action and performance – this paper will investigate the societal role of elite and non-elite members of the Mithraic cult. By examining the primary evidence derived from excavations dating to the first and second century A.D., this paper proposes that the establishment of the Mithraic cult in a far-flung capital of the empire created a convergence of social class and civic duty in Londinium Roman society.

Christy, Jason [147] see McCarthy, Elizabeth

Chrysanthi, Angeliki [125] see Earl, Graeme

Chuc, Ruben [36] see Gongora, Angel

Chuenwattana, Nattha, Gillian Thompson (University of Bradford) and Joyce White (University of Pennsylvania Museum of Archaeology and Anthropology)

[154] *Preliminary Archaeobotanical Results from Four Cave Sites in Laos*

This paper presents results of paleobotanical analysis of materials excavated from four cave sites in Luang Prabang Province (Laos) by The Middle Mekong Archaeological Project (MMAP) from 2006-2010. The sites have deposits dating from c. 13,000 BP cal. to the present. Archaeobotanical samples were collected from contexts thought likely to have good preservation, such as ashy deposits. These samples date predominantly from the terminal Pleistocene to middle Holocene period, and from the Hoabinhian and to the Iron Age. *Oryza* (rice), *Celtis* spp. (hackberry), *Canarium* spp., and possibly *Juglan* spp. have been identified. This paper will present evidence for variation in the four site assemblages in terms of chronology and site location. The relative efficacy of two data recovery techniques (i.e., flotation versus wet sieving) is also discussed.

Chuipka, Jason (PaleoWest Archaeology)

[123] *The Historicity of Data Collection: An Overview of Going Digital in the Northern Southwest*

The Bureau of Reclamation's Navajo-Gallup Water Supply Project was initiated in the fall of 2011. The two primary water pipeline corridors bracket the San Juan Basin and, consequently, cross hundreds of historic and prehistoric archaeological sites, traditional cultural properties, and in-use sites on the Navajo Reservation. PaleoWest has developed digital data collection methods that are intended to streamline fieldwork and reporting by reducing data redundancy. The over-arching purpose of the move to digital data collection is to maintain data quality while facilitating the timely documentation of cultural resources impacted by construction. Development of this system has required consideration of how data are collected, analyzed, and curated with respect to archaeological research goals, cultural resource laws, and the mandates of tribes. The historicity of archaeological practice in the northern Southwest becomes relevant as we attempt to determine whether digital data collection is a form of progress, or simply the repetition of past methods using a new platform. An important aspect of this discussion is how archaeological methods are affecting the way we interpret the past and, conversely, how our perceptions of the past are formed by the methods selected to gather data.

Chung, Christine [205] see Blagg, Jennifer

Ciccone, Jason (Van Epps-Hartley Chapter NYSA)

[90] *The Clovis Culture In New England-Hudson Valley Sites with Clovis Lithic Technology*

The Gainey culture was thought to record the oldest evidence of humans in New England dating between 12,900 and 12,700 cal BP. However, recent extensive research taken place at and around several extremely high quality lithic outcroppings from the Hudson Valley of New York, exhibit sites, which yield artifacts diagnostic of Clovis lithic technology (13,200-12,900 cal BP). Characteristics of the technology used include: bifaces that were produced by transverse lateral controlled overshot flaking from prepared isolated striking platforms located at the center plane of the preforms, isolated lobes that were also placed at the biface center plane and used for prepared striking platforms for flute removals as well, preforms that were fluted midway during the manufacturing process, and preforms that were further reduced in thickness after fluting had occurred. All of which are diagnostic traits of the Clovis culture's biface reduction sequence. Well

represented at these locations is the use and manufacture of blade and blade cores, the other hallmark of Clovis lithic technology. This revises the idea of an unoccupied New England prior to the Gainey complex, and confirms the fact that at least parts of New England were indeed occupied prior to Gainey by the Clovis culture.

Ciccone, Dario [105] see Toffalori, Elena

Cienfuegos, Edith [17] see Casar, Isabel

Cinquino, Michael [18] see Hayward, Michele

Cioffi-Revilla, Claudio [23] see Rogers, J. Daniel

Ciolek-Torello, Richard (Statistical Research, Inc.)

[64] *Home is Where the Hearth Is: Household and Domestic Organization at Grasshopper*

When I joined the Archaeological Field School at Grasshopper Pueblo in the early 1970s, I became part of a large research team dedicated to reconstructing prehistoric social organization using the "New Archaeology" approach. Many students and instructors at Grasshopper were studying mortuary and architectural patterns as means to identify different aspects of the organization of this mountain community. My interest turned to domestic organization. Previous studies suggested architecture might serve as a good indicator of the original function of rooms, but house function often changed during the developmental cycle of the domestic groups that resided in them. Fortunately, Grasshopper had a wealth of primary and de facto refuse associated with residential activities left in situ on the floors of dozens of rooms. These remains provided both more direct and detailed evidence of the structure of domestic activities and an independent source of data that could be used to test models of domestic organization developed from architectural evidence. Although my subsequent research has not taken me back to the study of pueblos, the lessons I learned at Grasshopper have proven invaluable in my professional career, much of which has focused on Hohokam and Salado households in desert settings.

[31] Moderator

Cirigliano, Natalia and Miriam Vommaro

[119] *Historical Occupations at the Southern Part of the Deseado Massif: The Case of La Gruta 3 (Santa Cruz, Argentina)*

Written sources do not mention the utilization of the southern part of the Deseado Massif by indigenous groups during historical times. Historical records, on the contrary, point to the utilization of open air spaces, close to main water courses. However, archaeological research has shown the occupation of rock shelters close to temporary ponds during these times at the southern part of the Deseado Massif.

The purpose of this paper is to summarize initial information obtained at a test pit made at La Gruta 3 rock shelter, where both lithic artifacts and exotic fauna with cut marks were recovered. Reasons for its utilization are analyzed taking into account available information for the area. We believe that the integration of both archaeological and historical information points to a better understanding of human behavior in the area during early historical times.

Clardy, Kelsey and Miriam Belmaker

[162] *Development of a Paleoclimatic Predictive Model Based on Gazella gazella Mesowear of the Last Glacial in the Levant*

Middle Paleolithic research has recently focused on patterns of climate change during the Last Glacial (MIS 6-3). Specifically, this research has focused on the effects of climate change on human population dynamics and the extinction of Neanderthals and the dispersal of modern humans (Finlayson, 2007; Shea, 2008). Most paleoclimatic predictive models are based on global climate proxies that are difficult to correlate with terrestrial ones (see Behrensmayer 2006) and therefore may be biased. In this study, we develop predictive paleoecological models using mesowear data. Mesowear measures the wear of molars on ungulates and has been found to correlate with diet (Fortelius and Solounias, 2000). We measured mesowear variables of wild caught *Gazella gazella* from the extensive collections at the Hebrew University in Jerusalem and Tel Aviv University. The location of each individual was geo-referenced using Global Information Systems (GIS). We developed predictive equations, by correlating mesowear data against a range of environmental variables including maximum June temperature, average January temperature, and average rainfall in Israel obtained from GIS data files. All were found to be highly significant. Therefore, mesowear can be used as an excellent predictive proxy for paleoclimates, although such predictive equations are species and region specific

Clark, Meagan [2] see Poteate, Aaron

Clark, John (Brigham Young University)

[4] Discussant

Clark, Jeffrey

[27] *Residential Mobility: A Model of Early Settlement Systems in the Central Pacific*

This paper proposes a "residential mobility" model for understanding the settlement system of colonizing and subsequent early settlement populations in the Manu'a Group, Samoa. The model is derived from the Binford's (1980) characterization of food foragers as populations who employ a strategy of residential mobility to take advantage of high productivity patches. In the residential mobility model, the settlement system for the first few centuries was based on extended/seasonal occupation of an area, after which the community moved its residence to a different location for another extended period of residence, and so on, in some rotational pattern. This residential pattern is neither strandlooping nor permanent villages of farmers. The model draws on the arguments of Kennett et al. (2006) for colonizing Oceanic populations by incorporating elements of the "low-level food producer" model favored by Kennett with aspects of "skimmer" model favored by Anderson. Thus, some food production supplements emphasis on marine foraging and fishing as the mobile community "skims" the best and preferred resources in an area for a period of time, thereby maximizing return while minimizing risk of over-exploitation. Archaeological evidence from three sites on Ofu Island will be used in the development and evaluation of the model.

Clark, Geoffrey (Arizona State University)

[64] *Thanks for the Memories: How Grasshopper Shaped my Career*

Grasshopper had a profound effect both on my choice of a career (I was originally a fine arts major) and on my perception of what it meant to become a professional archaeologist. I participated in two field seasons, first as a student (1964) and later as a member of the staff (1966). The first season, directed by Raymond Thompson, taught me the fundamentals of fieldwork, the importance of keeping an accurate and detailed log and, through field trips and site visits, exposed me to some of the important sites and personalities active at the beginning of the "processual" era. The second season, under the direction of William Longacre,

emphasized the importance of conceptual frameworks and inferential logic in assigning meaning to pattern in archaeological contexts, an interest I've maintained throughout my career. It also led to Honors (1966) and MA (1967) theses that sought to determine, using burial data, where the site fell in a neoevolutionary continuum of sociocultural complexity. I learned a lot at Grasshopper and enjoyed the experience immensely. It was an exciting time to be a student and I still treasure the memories.

Clark, Jamie

[68]

Bone fragmentation at Sibudu Cave: Evaluating the Relative Utility of Small Fraction (<2 cm) Non-Identifiable Bone

When confronted with a highly fragmentary faunal assemblage, archaeologists are faced with a choice of how to best incorporate the sometimes staggeringly large quantities of small, generally non-identifiable bone fragments. This material is often time and labor intensive to analyze, and questions can be raised as to the broader utility of this dataset; for example, does a thorough analysis of the small-fraction non-identifiable bone actually provide additional/unique information on fragmentation, site formation, or burning relative to larger-fraction non-identifiable (or even identifiable) bone fragments? In this poster, I use data from the Middle Stone Age site of Sibudu Cave (KwaZulu-Natal, South Africa) in order to evaluate the relative utility of the small-fraction (<2 cm) non-identifiable bone (consisting of hundreds of thousands of fragments and accounting for more than 98% of the total assemblage). I argue that while the analytical utility of this dataset is at least partially dependent on the type of questions being asked, the small-fraction non-identifiable bone should never be dismissed out of hand. At the very least, a baseline comparison of this dataset to that deriving from larger fraction non-identifiable remains is important for establishing appropriate sampling strategies.

Clark, Terence (Canadian Museum of Civilization) and Gary Coupland (University of Toronto)

[170]

Exploring the Lives of the Ancient Chiefs: Recent Research at an Elite Charles-Age (5500-3500 B.P.) Cemetery.

Since 2009, we have been excavating material from the site now known as "the Burial Ground", within shíshálh territory in southeastern British Columbia. This research has documented some of the most elaborate burials known on the Northwest Coast of North America. The summer of 2012 saw several new mortuary features uncovered to add to our growing dataset. This paper will present our new findings and synthesize these data into a regional context.

Clark, Angela (University of Otago), Nancy Tayles (University of Otago) and Siân Halcrow (University of Otago)

[219]

Sexual Dimorphism and Environmental Change in Prehistoric Southeast Asia

Sexual dimorphism, the size and shape differences between males and females, has been commonly employed as a measure of human biocultural adaptation in skeletal samples. A decrease in sexual dimorphism in skeletal size as a consequence of variation in males is generally associated with major environmental changes, including agricultural intensification.

This paper aimed to use long bone lengths (LBL) and epiphyseal dimensions (ED) to quantify the level of sexual dimorphism from a sample of 190 adult human skeletal remains from a single site in Northeast Thailand (1750 – 420 B.C.). This sample spans the period of the intensification of agriculture, with associated technological changes, increased trade networks, and changes in social complexity.

The results indicate two trends: 1) initially sexual dimorphism decreases in LBL and stasis in ED; 2) followed by, an increase in sexual dimorphism in LBL and ED. Unexpectedly, this investigation has shown that the changes in sexual dimorphism over time were the consequence of greater female variation compared with males. This is interpreted in the context of health

indicators in the sample and implications of the results on the general model of sexual dimorphism and health change during the intensification of agriculture are outlined.

Clark, Bonnie (University of Denver)

[257]

Creating Communities of Memory: The DU Amache Field School

Integrating stakeholders into the structure of a field school necessarily injects heritage concerns into a situation often otherwise focused on archaeological data and techniques. It is also ethical and efficacious practice, particularly at sites of living memory. For three field seasons the University of Denver field school has been held at Amache, the site of a World War II-era Japanese American internment camp. From its inception the field school has integrated intergenerational stakeholders both from the local community and those with direct historical ties to the site. While challenging both logically and budgetarily, it gives the project a powerful engaged edge. In addition, the project integrates public interpretation and museum studies, skills that strengthen, rather than detract from, student training in more traditional archaeological skills. This presentation overviews the structure of the DU Amache field school and some of the lessons learned since its inception in 2008.

Clark, Geoffrey (Australian National University)

[292]

Culture Contact and Chiefly Lineages in Tonga AD 1250-1880

Tonga in the second millennium AD was ruled by the paramount Tu'i Tonga lineage at the chiefly center of Lapaha on Tongatapu (Sacred Tonga). Archaeological investigation of the monuments, land names and stone tools of the Tu'i Tonga shows how Pacific Islander groups from beyond Tonga were incorporated into the centralized political structure and the significance of colonial relations in the development of the maritime chiefdom. European encounters in the 18th and 19th century led to a rapid shift in political power that influences how the heritage of the ancient Tu'i Tonga kingdom is viewed today.

Clarke, Mary (Savannah College of Art and Design)

[21]

Reconstructing Los Sapos: An Examination of Iconography in Context

Recent investigations at Xultun, Guatemala have uncovered the remains of an elaborate stucco façade decorating the north face of the entrance to a small square building, potentially a sweat bath. This Early Classic period (AD250-550) façade depicts a large, squatting frog with a doorway into the structure situated between its legs. In this paper, I survey the art and architecture of the Maya lowlands, exploring the iconography of frogs and the various meanings attached to this frog's figural pose, ending with a full artistic reconstruction of this structure. The iconography of this façade illustrates and confirms the visual relationship between birthing rituals, frogs, and sweat baths. By combining these iconographic elements with architectural evidence, alongside similar examples from elsewhere in the region, I hope to illuminate some aspects of the functions and meanings attached to not only this sacred structure, but others like it throughout the ancient Maya world.

Clarke, Andrew [47] see Prost, Stefan

Clarkson, Chris

[28]

What Gave Rise to the South Asian Microlithic? Modern Human Arrival or Climate Change?

The role of microlithic industries in the dispersal of modern humans and the colonization of South Asia continues to be the focus of debate. In the absence of a rich fossil record, debate largely hinges on the lithic record. This paper examines continuity and change in lithic technology in South Asia and compares this with lithic industries found along the southern arc from Africa to

Australia between 75-40kya at the time of likely modern human colonization. It is proposed that microlithic industries were not a feature of the colonizing toolkit of modern humans, but were a later adaptation to variable climatic conditions that may also have involved some population movement. Modern human colonization, on the other hand, more likely featured a pre-microlithic, sub-Saharan African technology undergoing successive founder effects. The proposed hypothesis is consistent with the dating of the microlithic in South Asia and elsewhere, recent genetic findings and the fossil record, as well as with theoretical propositions about social transmission among small colonizing populations and the role of risk and demography in generating technological innovations.

Clarkson, Chris [150] see Marwick, Ben

Clasby, Ryan (Yale University)

[285] *The Ceja de Selva Uncovered: Exploring Long-Term Cultural Developments in the Jaén Region of the Northeastern Slopes of the Peruvian Andes*

In attempting to understand long term cultural developments within the Central Andes, the densely forested eastern slopes or "ceja de selva" region has often been overlooked or dismissed as a sparsely inhabited buffer zone between the highlands and the tropical rainforest. Recent research in the Jaén region of northern Peru has begun to change these misconceptions; however, as investigators have found evidence of large sites featuring both exotic items and monumental architecture. Rather than a backwater, data from Jaén shows that certain areas of the ceja de selva were well populated and deeply involved in interregional exchange networks with the coast and the highlands. This paper will explore long-term cultural developments in the Jaén region and the northeastern slopes of Peru by focusing on the excavation and survey results from Huayurco, a site that has an occupational history beginning around 800 B.C. and continuing until late in Andean prehistory.

Clay, R. Berle [34] see Hargrave, Michael

Clayton, Sarah (University of Wisconsin-Madison)

[63] *Society beyond the City: Rural Life in the Teotihuacan-Period Basin of Mexico*

The development of Teotihuacan, an early urban state of remarkable size, complexity, and interregional significance, brought sweeping changes to settlement patterns and daily life across the Basin of Mexico. Teotihuacan politically dominated the region, but richer detail concerning social organization, identity, and daily practices among rural households is needed to better understand the character of Teotihuacan society and the administrative strategies of the state. If rural populations were politically subordinate to the state, does it follow that they socially identified as members of Teotihuacan society? Did they engage in daily and ritual practices that expressed social affinity with segments of urban society? How important was the cultivation of a widely shared Teotihuacano identity for regional political cohesion? Data pertaining to residential organization, ritual practices, and settlement longevity at select rural settlements are marshaled to explore these questions, including research from a new project at the rural settlement of Chicoloapan Viejo. A preliminary comparison of rural settlements suggests that there was considerable diversity among them with respect to social organization and ritual life. Moreover, the particular social histories of rural settlements are likely to have significantly shaped processes of statecraft and the methods of regional political administration employed by governing elites.

Clement, Beverly (Louisiana State University), David Chicoine

(Louisiana State University) and Linda Cummings (PaleoResearch Institute)

[236] *Early Horizon Plant Use and Diet at Caylán: Insights from Macrobotanical Remains and Human Coprolites*

A predominant theme in Andean archaeology is to understand subsistence strategies practiced by humans during critical social, economic, and political periods in Peruvian prehistory. Recent excavations at the site of Caylán (800-1BCE), have unveiled ample amounts of plant and other organic remains. This research presents a two-part analysis: (1) examination of macrobotanical remains from the 2009 field season and, (2) analysis of excavated human coprolites found in various contexts of the site during the 2010 field season. Taxonomic identifications and patterns of intra-site distribution of the plant remains are considered in light of the economic and social meanings attached to industrial and food plants. The incorporation of preserved coprolites provides unique evidence for how humans physically incorporated plants into their livelihood -- mainly, their dietary regime. Examinations at Caylán of how plants participated in past human-environment interactions allow for direct correlations between the presence of cultivated and domestic plants and what was actually being consumed by prehistoric inhabitants of Peru.

Coakley, Corrine [125] see Manahan, T.

Cobb, Charles (South Carolina Institute of Archaeology and Anthropology) and Chester DePratter (South Carolina Institute of Archaeology and Anthropology)

[24] *The Many Faces of Colonial Borderlands*

Any given Native American group in colonial southeastern North America typically interacted with multiple European powers. As a result, some indigenous territories manifested two to three frontiers, each made distinct by its interface with a different European presence. During the 17th and 18th centuries A.D. many of the peoples we view as distinctive ethnic entities expressed complex internal divides as they developed various modes of engaging several colonial powers simultaneously. These differences, ranging from religious beliefs to trade practices, had a geographic bent as they were oriented toward different European powers on the landscape. The Chickasaw of Mississippi and Yamasee of Carolina provide compelling examples of contrasting multiple frontiers.

Coben, Lawrence (UPENN and the Sustainable Preservation Initiative)

[164] *Sustainable Preservation: Utilizing Community-Based Economic Development and Entrepreneurship to Save Sites*

The leading cause of the destruction of cultural heritage is economic development and alternative economic uses of cultural heritage sites, including agriculture, home construction and looting. Many paradigms of preservation fail to provide appropriate economic incentives for local communities to save their archaeological sites. Rather, they ask these communities to preserve cultural heritage even when alternative uses of sites enable underprivileged local residents to feed their families and improve their lot in life.

In this paper, I discuss how empowering local entrepreneurs and communities and supporting locally-owned businesses whose success is tied to successful site preservation is a superior paradigm of preservation for cultural heritage. I utilize data from the projects of the Sustainable Preservation Initiative to demonstrate the benefits of a community-based economic development approach to saving our past.

Cobos, Rafael (Universidad Autónoma de Yucatán)

[113] *Construction Sequence of the Great Terrace*

*and Associated Buildings at Chichén Itzá,
Yucatán, México*

Excavations conducted at different buildings standing upon the Great Terrace at Chichén Itzá revealed several architectural contexts associated with ceramics dating to the Late and Terminal Classic periods. This paper focuses on the architectural sequence of edifices built before and after the construction of the Great Terrace. The results of such a construction sequence show that, prior to the tenth century, the Great Terrace did not exist; however, after A.D. 900, the site center of Chichén Itzá was placed at the Great Terrace and structures were built during the tenth and eleventh centuries.

[113] *Discussant*

Cobos, Rafael [113] see Jimenez, Socorro

Cochrane, Ethan (University of Auckland)

[106] *Artifact Classification and Networks: A Case Study from the Southwest Pacific*

The vast and rapid geographic spread of Lapita pottery across more than 50 islands, 200 sites, and 4,000 km of ocean in the southwest Pacific has stimulated research on Lapita networks for 50 years. Much of this research concerns the cultural relatedness of Lapita populations, ranges in its involvement with networks from dalliance to the explicit tools of graph theory, and has at times produced contradictory results. I argue here that to evaluate contradictory results and fruitfully use networks at any level of involvement we must pay special attention to archaeological classification (including node definition) and its links to explanatory theory. My argument is supported by comparisons of my own and others research on Lapita networks.

[27] *Discussant*

Cockrell, Bryan (UC Berkeley, Anthropology), José Luis Ruvalcaba Sil (Instituto de Física, UNAM) and Edith Ortiz Díaz (Instituto de Investigaciones Antropológicas, UNAM)

[253] *Several Roads Lead to Chichén Itzá: Tracing the Fabrication Histories of Metals Deposited in the Cenote Sagrado*

Through multiple 20th-century projects, metal objects (bells, rings, figurines, among other forms) were recovered from the Cenote Sagrado, a water-filled sinkhole at Chichén Itzá, Mexico. Considering the lack of local metal deposits and the absence of metallurgical activity at Chichén, the objects must have been imported. This project proposes that archaeometric analysis of the metals can reveal their fabrication histories, and, in turn, the objects' origins and those of the travelers who brought them to the Cenote. Maintained in three museums in the US and Mexico, the objects (n=148) were documented through visual inspection and then optical microscopy (visible, UV, and IR), and their elemental compositions were elucidated through ED-XRF spectrometry. The assemblage contains a mixture of worked and cast objects, and the most prevalent compositions are Cu-As and Au-Ag-Cu alloys. Through attention to superficial manufacturing traces (joins, porosity, core vestiges) as well as evidence of alteration (indentation, fracture, crumpling) that could have been produced during ritualized deposition at the Cenote, this project aims to trace the routes that metal objects followed from their original fabrication to their deposition, recovery, and conservation. Likely origins for the objects include West and Central Mexico as well as Lower Central America.

Codding, Brian (University of Utah)

[2] *A Novel Multivariate Model of Shellfish Exploitation*

For coastal hunter-gatherer populations, shellfish represent a reliable protein-rich resource; for archaeologists, a durable marker of past subsistence strategies. But understanding exactly what variability in shellfish assemblages means about past human

behavior and environmental interactions requires understanding detailed information on human selectivity, transportation bias and the potential for resource over-exploitation. Here we present a general model of shellfish exploitation that combines data on species utility, transport costs, and life-history in order to predict which resources should be taken preferentially, which are more likely to appear in middens, and which are more likely to be over-exploited. The model results are discussed in reference to the Pleistocene colonization of Australia and Late Holocene shell middens in California.

[2] *Chair*

Codding, Brian [212] see Bird, Douglas

Codlin, Maria (University of Otago) and Mark D. McCoy (University of Otago)

[62] *Geochemical Sourcing and Inter-island Movement of Volcanic Glass in the Hawaiian Islands*

X-ray fluorescence (XRF) is a popular tool employed in Hawai'i for documenting interaction within the archipelago, especially through examining formal basalt tools. Volcanic glass is also an excellent material for identifying interaction since it is ubiquitous in Hawaiian sites and was used in a range of everyday contexts. However, of the many potential sources of local volcanic glass, only one highly distinctive source has been well characterized, limiting our potential to discuss inter-island exchange. Using a Bruker AXF, Portable EDXRF, we analyzed over 1,000 artifacts from the islands of Kaua'i, O'ahu, Moloka'i, Maui and Hawai'i. Several distinct sources of post-shield volcanic glass were readily identified. But, distinguishing between the more homogenous shield building volcanic glass flows has proved more challenging. Recently we turned to LA-ICP-MS to determine if it is possible to discriminate between these shield volcanic glasses. In this paper we discuss our results both in terms of the geochemistry of Hawai'i's volcanic glass and the movement of material throughout the archipelago, which current evidence suggests was remarkably frequent between some islands, but relatively limited between others.

Coello, Alexandre (Universitat Pompeu Fabra)

[95] *The Writing of the First History of the Mariana Islands, by Charles le Gobien, SJ*

In 1668, several Jesuits led by Father Diego Luis de San Vitores arrived to the Mariana Islands to evangelize the Chamorro population. Four years later, he died as one of the first martyrs in the archipelago. However, the Jesuits remained in those distant islands to the expulsion of the order in 1769. Drawing from a world history of Christianity, this submission aims at presenting the process of writing of the first History of the Mariana islands, by the French Jesuit Charles Le Gobien, covering the landing of the first Jesuits in 1668 to 1695. The book was first published in Paris in 1700; however, besides Le Gobien, some other Jesuits participated in crafting this History, particularly some Spanish missionaries, such as Luis de Morales, who wrote reports and Annual letters, which were sent to Madrid and Rome. Throughout this presentation I will provide with some information regarding the reasons why the Society of Jesus decided to publish the History in France, rather than in Spain.

Coffey, Tonya [98] see Stemp, William

Cofran, Zachary [149] see Pugh, Christina

Cohen, Jenny (University of Victoria)

[88] *Paleoethnobotanical Evidence from Kilgii Gwaay, a 10,700 Wet Site on the Northwest Coast of North America*

Kilgii Gwaay is an intertidal waterlogged archaeological site dating to 10,700 cal. B.P., located in southern Haida Gwaii, British Columbia. Excavations in 2001 and 2002 revealed the site's significance as one of the earliest known examples of preserved plant usage on the Northwest Coast. Further work in 2012 has added considerably to known plant technologies and paleoecology from the site. The poster presents the evidence of woodworking, cordage and wooden tools in relation to a deep temporal context for Northwest Coast plant technologies. Additionally, paleoenvironmental data from plant-based artifacts and seed remains will be the focus for discussing ancient human activity on the landscape. The implications of these data classes for archaeological research on the early occupation on the Northwest Coast will also be discussed.

Cohen, Jenny [137] see Orchard, Trevor

Cole, Sally (Natural History Museum of Utah)

[85] *Solidifying Culture: Evidence of Post-200 B.C. San Juan Basketmaker II Coalescence at Falls Creek Shelters (5LP1434), Southwest Colorado*

Clusters of rock paintings at Falls Creek Shelters, type-site for eastern San Juan Basketmaker II, are presently examined in the context of updated documentation and chronological data. The clusters were discussed by E. H. Morris and H. S. Daniels in a 1954 report of investigations at the site and occur above and behind discrete "cultural terraces" exhibiting increased activity after 200 B.C. They are generally, stylistically consistent with rock paintings found elsewhere at the site but incorporate typical and colorful western Basketmaker II ceremonial imagery, and, unlike the mostly black and white elements elsewhere, are openly displayed. The subject paintings signify an alliance with western San Juan practices, presumably strengthened through public participation. This kind of interaction explains the cohesiveness of Basketmaker II culture over considerable time and space.

Cole, Ethan (UCLA)

[166] *Thinking Big with Aveni*

For over fifty years, Anthony Aveni has challenged generations of students with diverse academic backgrounds to consider native traditions that extend beyond the bounds of Western concepts of time and space. This talk highlights some of the author's own experiences with Professor Aveni as a teacher, mentor, and colleague.

Collard, Mark [58] see Carleton, William

Collard, Mark (Simon Fraser University), April Ruttle (Simon Fraser University), Briggs Buchanan (University of Missouri and Simon Fraser University) and Michael O'Brien (University of Missouri)

[217] *Population Size and Cultural Evolution in Non-Industrial Food-Producing Societies*

Modeling work suggests that population size affects cultural evolution such that larger populations can be expected to have more diverse and complex cultural repertoires than smaller populations. However, empirical tests of this hypothesis have yielded conflicting results. Here, we report a study in which we investigated whether the subsistence toolkits of small-scale food-producers are influenced by population size in the manner suggested by the population size hypothesis. In the study, we applied simple linear and stepwise multiple regression analysis to data from 40 non-industrial farming and pastoralist groups to test the population size hypothesis. The results of the analyses were consistent with the predictions of the hypothesis. Both the diversity and the complexity of the toolkits of the food-producers were positively and significantly influenced by population size in the simple linear regression analyses. The multiple regression

analyses demonstrated that these relationships are independent of the effects of risk of resource failure, which is the other main factor that has been found to influence toolkit diversity and complexity in non-industrial groups. Thus, our study strongly suggests that population size influences cultural evolution in non-industrial food-producing populations.

[217] *Chair*

Collins, Ben (McGill University)

[76] *A New Analysis of the Foraging Strategies during the Final Middle Stone Age at Sibudu Cave, South Africa*

This study presents a new analysis of the Final Middle Stone Age (~38,000 years ago) faunal materials from Sibudu, South Africa. The faunal assemblage is contextualized within the extensive paleoenvironmental framework that has been developed for the site, facilitating a more detailed understanding of the subsistence strategies that were being used. This research demonstrated that the Final Middle Stone Age foragers at Sibudu were exploiting two different resource patches at the same time, using different strategies. One patch consisted of large game exploited further away from the camp; and the other consisted of small game exploited near the camp. Ethnographic and ethnoarchaeological data were used to construct heuristic interpretations of these foraging strategies, especially with regard to the composition of the foraging parties.

Collins, Paul W. [88] see Etnier, Michael

Colomer, Laia

[72] *Cultural Heritage and Silent Homesickness of Retiring Refugees*

The immigrant condition is that of trying to adapt oneself to the new culture and society while keeping (adapting, adjusting, denying) one's own cultural habits and identity. This is a long, painful process that sometimes ends in a silent homesickness. This condition of being unwell may deepen over time. During the early 1970s thousands of Chileans escaped the dictatorship of Augusto Pinochet and arrived in Sweden as political refugees. Today they are considered the largest and the best-integrated group of immigrants in Swedish society. The first refugees are now in their 60s and are therefore going to retire in Sweden soon. This paper examines how cultural heritage may help with this silent homesickness of Chilean immigrants and political refugees, especially when they arrive in their third age. It is assumed that the capacity of meaningful expressions of cultural heritage, either recovered from early memories but also from those experiences gained during the migration process, may play a positive role in overcoming migration homesickness. Cultural heritage may be seen here as healing experience to increase life quality for immigrants and aging refugees.

Colten, Roger (Peabody Museum of Natural History, Yale University) and Brian Worthington (Southeastern Archaeological Research)

[130] *Archaic Era Subsistence at the Las Obas and Vega del Palmar Sites, Cuba*

The earliest inhabitants of Cuba were hunter-gatherers that arrived from Central America approximately 5,000 years ago. Although the nature of their subsistence economy is not well documented, recent analysis of vertebrate faunal remains indicates that they exploited a variety of marine, estuarine and terrestrial habitats. In this paper we compare and contrast vertebrate faunal data from two sites located in different regions of the island, the Las Obas site which was located near Manzanillo in the southeastern part of the island, and the Vega del Palmar site, which was located near Cienfuegos Bay on the south-central part of the island. These vertebrate faunal assemblages are dominated by various species of hutia, some of which are now extinct, and fish.

Coltrain, Joan B. [71] see Beck, R

Colwell-Chanthaphonh, Chip (Denver Museum of Nature and Science) and Stewart Koyiyumptewa (Hopi Cultural Preservation Office)

[67] *The Hopi Model of Cultural Preservation*

In this paper we summarize the cultural preservation efforts led by the Hopi Cultural Preservation Office (HCPO), under Leigh J. Kuwanwisiwma's leadership since 1989. This work has covered a broad array of archaeological, anthropological, historical, and archival topics and themes, and in practice has ranged from the development of language programs to protecting sacred sites to repatriating sacred objects. This review will demonstrate how and why the HCPO has effectively used the social sciences to serve the Hopi people. Through a commitment to collaboration, the HCPO shows that Native Americans are not inherently antagonistic to archaeology and its sister disciplines—only to the model of science that is irrelevant, disrespectful, and unhelpful to the people it studies. By putting science in the service of its community, the Hopi approach to cultural preservation provides a model of mutual benefit to both archaeologists and Native peoples.

Comber, Michelle (Caherconnell Archaeological Field School, National University of Ireland, Galway)

[242] *Reconstructing Medieval Irish Society: The Caherconnell Archaeological Project*

Documentary sources reveal much about Early Medieval (5th – 12th century AD) and Medieval (12th – 16th century AD) Irish society. They depict a chiefdom-based society, carefully structured and controlled by a ruling elite. A number of such chiefdoms can be, and have been, identified in the Burren region of Co. Clare on Ireland's western seaboard. The upland karst landscape of the Burren made it a popular focus for settlement, and has contributed to its excellent archaeological preservation. The ongoing Caherconnell Archaeological Project involves both landscape survey and site excavation. It is exploring the social organization of Early Medieval and Medieval Ireland through an initial examination of chronological, political, cultural and landscape contexts within a chosen study area in the central Burren. Detailed mapping has allowed the development of local social theories, ideas currently being tested by excavations in Caherconnell townland, a place that was once the capital of a simple chiefdom or chiefdom section. Results are revealing a more complex society than even the detailed documentary evidence suggested. It is hoped that this evidence will eventually shed more light on Irish society, moving from the broader landscape to individual settlements and back again to the wider social context.

Comeau, Brad [117] see Slater, Jessica

Comeau, Brad (ASM Affiliates, Inc.) and Jessica Slater (University of Sheffield)

[226] *Dry Run on a Dry Well: An Experimental Investigation of Sintashta Metallurgy*

Excavations of the Sintashta complex of Bronze Age sites in the southern Urals, Russia have led to a prevailing interpretation that metallurgy played a central role in western Siberian society. This idea is based in part upon an inferred (and debated) industrial scale production within what seems like a contradictory context: domestic residences. Furnaces are central in assessing the scale of production as they are one of the limiting factors of production. At Sintashta the most widely accepted, yet rarely criticized, furnace design posits the use of a well to create a draught through a tunnel to provide the necessary oxygen for the fire.

An experimental firing campaign was undertaken using a construction of the Well-Tunnel-Furnace (WTF) to evaluate the practice and scale of metal production at Sintashta. Practical

engagements of the participants were noted and used to supplement temperature and atmospheric condition data to examine both what happens in the furnace and how those conditions were achieved. The experimental results show many conceptualizations of the WTF are inaccurate and that use of the WTF would have represented an inefficient metal production practice. Further research avenues are suggested to (re)locate and contextualize Sintashta metal production facilities and activities.

Comer, Douglas (Cultural Site Research and Management (CSR))

[221] *Identity and Archaeology as Public Good*

The economist Paul Samuelson described a public good as ... "[goods] which all enjoy in common in the sense that each individual's consumption of such a good leads to no subtractions from any other individual's consumption of that good..." (1954). I argue here that archaeological material is a type of public good, and should take its place as such alongside fresh air, water, knowledge and navigational and lighthouses. The good that archaeological material provides is data that are relevant to the human past. Such data are a means to many ends of great interest and value to human beings. Among them are those by which to postulate, test, and verify identities based on kinship and historic ties to specific landscapes, and perhaps more importantly to counter such claims formulated for transitory political or ideological purposes. Public goods are degraded by excessive use or misuse. Air and water become polluted, unlimited access can eventually exclude individuals from goods once thought of as being non-excludable (sometimes referred to as "the tragedy of the commons"), and knowledge can be repackaged as disinformation in the absence of critical review. We examine here some ways in which this has and can be done.

Comer, Margaret (EAC/Archaeology, Inc.)

[221] *Ancient Bodies, Modern Ideologies: Bog Bodies and Identity in Denmark and Ireland*

As the forces of globalization continue to move people, commodities, and ideas across national borders, the concept of national identity becomes fraught, with long-held assumptions regarding "belonging" and "not belonging" due to ethnic or cultural group membership called into question. In many nations, human remains of ancient people are often pulled into the debates, as their very bodies become symbols and evidence of long-standing identities linked to the respective lands. In Denmark and Ireland, the well-known bog bodies found within modern national boundaries have played and continue to play prominent roles in national and popular narratives of national identity, belonging, and self-conception. In particular, the narratives of ancient identity surrounding the bog bodies displayed by national museums are reflected in current national and international political debates about immigration, assimilation, and tolerance. Whether the bodies are made to play parts in narratives supporting or debunking ideologies of inclusion, exclusion, xenophobia, or tolerance, and whatever personage the bodies embody in telling the history of each country, the practice raises questions regarding the ethics of using ancient people to "speak" for ideologies with which they would have had no contact in life.

Commendador, Amy (Idaho Museum of Natural History), Julie Field (Ohio State University), John Dudgeon (Idaho State University) and Timothy Rieth (International Archaeological Research Institute)

[27] *The Diet of Rodents, Pigs, and Dogs in Prehistoric Hawai'i Island: Implications for an Evolving Agricultural Landscape from Isotopic Analyses*

One primary means by which post-colonization dietary development and adaptation is explained is through the emergence of novel resource utilization strategies, as colonizers become established and native environments are explored, incorporated and modified. Due to their commensal relationship

with human colonizers, a variety of mammalian and avian species in the Pacific may serve as isotopic proxies for reconstructing human diet and human-induced ecological change during and after island colonization. To test this, we analyzed carbon and nitrogen isotopes from a sample of rodent, dog, and pig remains collected from archaeological residential features on Hawaii Island, which range in age from AD 1400 (perhaps only few centuries following initial colonization) to the contact period. Carbon enrichment is suggested from the diet of the rodents, which may be indicative of environmental change, or the addition of marine products and/or sugarcane to the upland Hawaii environment. The dog and pig diets provide a tentative indication for animal husbandry practices in developed, agricultural landscapes. These results offer primary evidence for the construction of a food web for prehistoric Hawaii, and for models of human demography and landscape change in post-colonization island environments.

Commendador, Amy [47] see Dudgeon, John

Congram, Derek [193] see Tuller, Hugh

Congram, Derek (Joint POW/MIA Accounting Command, Central ID Lab) and Greg Berg (Joint POW/MIA Accounting Command, Central ID Lab)

[251] *Archaeological Recovery at an Aircraft Crash Site on a Glacier*

This presentation will discuss a survey and recovery operation on Colony Glacier in Alaska, where material and human remains were discovered from a 1952 military aircraft crash with 52 persons on board. The presentation will address the multiple challenges faced on account of the nature of the site, environmental conditions, and will explore how well-established JPAC standard operation procedures were adapted to maximize the recovery, while maintaining spatial control and ensuring thorough documentation of the scene.

Northern environments present distinct challenges for archaeological survey and recovery. Due to these challenges, access and opportunity to conduct fieldwork is often limited. Many past crash sites in cold, difficult-to-access environments have been neglected by the authorities for pragmatic reasons. The feasibility of investigating such historic sites is increasing on account of changing weather patterns, a greater ability to locate, monitor and reach the sites, and a greater understanding of how to best process them. For this reason, learning from the past experience of others in similar environments allows us to reconsider if and how we can approach other sites, and plan for future recoveries.

Conkey, Margaret [80] see Maher, Lisa

Conkey, Margaret (UC-Berkeley)

[105] *Out of the Stone Age: Towards an Integrated Digital Archive for a Paleolithic Survey*

Between 1993 and 2006, we carried out a regional open air survey project, Between the Caves, in the foothills of the French Central Pyrénées, with a focus on recovering Paleolithic traces across a landscape of some 260 square km. Data collection was primarily on paper forms, with associated photos and maps. Digital terrain models for the region identified probable sediment movements since 15,000 years ago and predicted depths of sediment accumulation since Paleolithic times. More than 350 locations, primarily plowed fields, were surveyed and more than 6000 artifacts recovered. Detailed inventory of artifacts (typo-technological) has been done for more than 3000 artifacts in an Access database with continuing work on the remaining artifacts. This paper discusses the transition of these data into Filemaker,

and the association of other site and artifact specific data such as photos, maps, GIS results, digital terrain information, artifact densities per site, etc., into a single relational archive for the iPad. Continued survey will be carried out as iPad-based.

[118] *Discussant*

Conlee, Christina (Texas State University)

[214] *Reevaluating Nasca Society in the Southern Drainage: A Perspective from the Site of La Tiza*

Recent research at the site of La Tiza has revealed that it was a multicomponent settlement with substantial Nasca culture occupation. During Early Nasca in the southern drainage it has generally been thought that most sites were small villages located primarily in the upper river valleys. However, the Early Nasca habitation area at La Tiza (associated with Nasca 3 and 4 pottery) was large, and the settlement was located in the middle valley. The size and complexity of the Early Nasca occupation suggests that there was a larger diversity of settlements, and perhaps a larger population than was previously evident in the southern drainage. There was also a Middle Nasca component at the site that consists of a burial and ritual area that appears to have been a Nasca 5 intrusion into the earlier habitation. The relationship of Nasca 5 to Early Nasca is unclear. There is no Late Nasca at the settlement showing a serious disruption at this time, which is curious given its favorable geographic location. By AD 700 the settlement was re-inhabited by Middle Horizon people and it was once again used as a domestic site, and also as an extensive burial ground.

Conlin, Dave (United States National Park Service), Larry Murphy (United States National Park Service) and Daniel Lenihan (United States National Park Service)

[230] *The Underwater World of Richard A. Gould*

In 1981 Richard Gould Chaired a School of American Research Advanced Seminar on "Shipwreck Anthropology." That symposium, and the 1983 volume that resulted in it, put two words together and sketched out a bold vision for the field of underwater archaeology that continues to inspire and inform fieldwork to this day. This talk will discuss the theoretical underpinnings of Dick's shipwreck anthropology, how he himself answered his call to action and how his students and others have followed up on one of the most promising and fruitful areas for anthropologically informed archaeological research in the field today.

Conlogue, Gerald [1] see Ordoñez, María

Conlogue, Gerald (Quinnipiac University), Tania Blyth (Diagnostic Imaging Department, Quinnipiac University), Natalie Pellitter (Diagnostic Imaging Department, Quinnipiac University), Robert Lombardo (Bioanthropology Research Institute, Quinnipiac University) and Kim Laura Ziegler (Johann-Friedrich-Blumenbach Institute for Zoology)

[260] *A Preliminary Investigation into the Effects of X-Ray on the Recovery of DNA from Skeletal Remains Found at the Yale-New Haven Hospital Construction Site*

Concern over the mutagenic effects of radiation exposure has increased over the past decade due to the proliferation of high dose clinical radiographic procedures, particularly multi-detector computed tomography, MDCT. During the same period, the use of MDCT to examine mummified and skeletal remains has also increased. Although there has been speculation concerning possible damage to DNA recovered from ancient remains following exposure to radiation, little research has been published. Grieshaber et al. (2008) attempted to determine the specific effect of x-ray and computed tomography on the amplification of DNA from bone. Although the results "suggested" exposure to clinical level of radiation decreased the recovery of aDNA, there were a

number of flaws with the study. The present study utilized 1850s human skeletal elements recovered from the Yale-New Haven Hospital excavation site to more accurately examine the issue and question the previous study's findings. We will discuss the physical basis for macromolecular damage due to radiation exposure and the minimal effects on DNA recovery found in the present study.

Connan, Jacques [125] see Brown, Kaitlin

Connaughton, Sean P. [262] see Herbert, James

Conners, Melinda G. [88] see Etnier, Michael

Connolly, Robert (University of Memphis)

[269] *Alternative Measures for the Impact of Archaeological Outreach and Education*
A conundrum in evaluating public education and outreach projects in archaeology is that we often do not assess the impacts of those cultural programs in cultural terms. For example, is the number of attendees at an archaeology month presentation an accurate measure of the success of educational efforts in cultural heritage preservation? Further, we often use short-term measures to address long-term problems. This poster explores models for assessing public education and outreach that incorporate alternative schemes such as the evaluation of cultural measures that are the actual desired end products of education and outreach efforts.

Conrad, Cyler [7] see Van Vlack, Hannah

Conrey, Richard [62] see Goodman-Elgar, Melissa

Consortium, PASNP [22] see Bhak, Jong

Constan, Connie [85] see Kulisheck, Jeremy

Consuegra, Susana [95] see Cruz Berrocal, Maria

CONTE, Eric [27] see MOLLE, Guillaume

Contreras, Daniel A. [33] see Kimber, Tom

Contreras, Daniel (Kiel University)

[180] *Reading an Anthropogenic Landscape: Setting as Media at Chavín de Huántar, Peru*
The anthropogenic landscape at Chavín de Huántar has remained in the shadow of the site's massive structures, complex lithic art, and highly elaborated material culture. Nevertheless, the site's dynamic landscape setting, changeable during its ~500 years of use as a ceremonial center due to both anthropogenic and geomorphic factors, is an important focus of investigation in three respects. First, Chavín's landscape is evidence of capacity, allowing us to ask what kind of labor mobilization and organization, as well as expertise, is implied by the landscape evidence. Second, the modified landscape provides evidence of message, allowing us to ask what Chavín's designers were trying to communicate, and to whom. Third, Chavín's landscape provides evidence of worldview, inasmuch as it prompts us to ask what it may suggest that landscape setting was a medium of interest for Chavín's designers. Focusing on these three aspects enables reading Chavín's landscape setting as a means of understanding both the ways in which Central Andean peoples related to their

environment in the Middle and Late Formative Period (1200-500 BCE) and the ways in which emergent elites exploited that relationship.

Cook, David, Jeffrey Glover (Georgia State University) and Ian Johnson (University of Sydney)

[119] *The Phoenix Project: Resurrecting the MARTA Archaeological Collection and Atlanta's Past*
During the 1970s, Georgia State University (GSU) archaeologists conducted systematic excavations associated with the construction of the Metro Atlanta Rapid Transit Authority (MARTA) rail lines. This project recovered the material remains of Atlanta's past, and these materials represent the single most comprehensive archaeological collection of Atlanta's history. Showcasing significant "moments" in the life of the city, the majority of the collection corresponds to the late 19th and early 20th century, the time of Atlanta's rebirth as a major metropolitan area. In addition, the excavations themselves are among the pioneering projects of urban archaeology in the then nascent field of CRM. The entire collection (over 100,000 artifacts and all the documentation) has recently been returned to GSU. To aid both researchers and the public, we are developing a collaborative research environment driving a public web front end, based on the successful Heurist platform (<http://heuristscholar.org>). This poster outlines our preliminary efforts to revitalize this long-forgotten collection in order to shed light on the development of the Southeast's largest city and engage the public about the benefits of archaeology. The Heurist platform allows us to engage with this collection in ways that were never dreamed of when this project began in the 1970s.

Cook, Anita [132] see Bray, Tamara

Cook, Reese (Epsilon Systems)

[139] *Analyses and Implications of Prehistoric Southwestern Tradeware Pottery from the Mojave Desert and Coastal Areas of California*
Prehistoric Southwestern cultures of the US are known for their highly decorative pottery styles and expansive trade systems. Building on previous studies along with providing new research data, this study identifies and documents prehistoric southwestern ceramic fragments and vessels from Mojave Desert and Coastal sites of California. A type and petrography identification analysis offers insight on tracking exchange between prehistoric peoples of California and the Southwest. ESRI GIS software tools will assist in identifying possible trade routes specific to each southwestern cultural represented in the ceramic assemblages and with consideration to geographical features, cultural boundaries, and travel between sites. Accurate dating of pottery types from the southwest and tradewares found in other regions provide temporally accurate indicators of interaction. Therefore, identifying temporally diagnostic tradeware ceramics from multiple regions of California elucidates trading trends through time for specific cultures and regions. Quantifying culturally identifiable Southwestern tradeware ceramics further helps determine the amount, degree, and the strength of exchange interaction between the two regions.

Cook, Ángel García

[231] *El surgimiento de las grandes ciudades el altiplano central y el comportamiento de Tlaxcala durante el llamado periodo "clásico"*
Durante los siglos anteriores al inicio de nuestra era se produce una gran revolución cultural al oriente del Altiplano Central; las condiciones ambientales permiten el surgimiento y utilización de un complejo sistema de cultivo –canales, represas, camellones, surcos, chinampas– y en general de la tecnología en todos sentidos llega a su máxima expresión. La “religión” igualmente adquiere fuerte esplendor. Se vive en una etapa de grandes avances tanto de carácter tecnológico como intelectual, se llega a un gran apogeo cultural. Todo ello logra el despegue de tres

grandes ciudades: Cantona, Cholula y Teotihuacán. Esta situación produce que en buena parte -1800km²- del territorio que actualmente ocupa el estado de Tlaxcala sufra un fuerte estancamiento cultural; al parecer debido a la negativa de quedar bajo el control político-económico de algunas de estas grandes ciudades. Los centros mayores de esta zona de Tlaxcala, junto con aldeas vecinas se agrupan a manera de "Cacicazgos" o "Señoríos", se fortifican y trata de mantenerse independientes de estas tres grandes ciudades en pleno apogeo. La cultura resultante en esta superficie la hemos nombrado como Cultura Tenayecac.

Cook, Jacqueline

[246] *Discussant*

Cookson, Corey (University of Alberta) and Kisha Supernant (University of Alberta)

[206] *An Analysis of Site Selection Behaviors and Landscape Use in the Prince Rupert Harbor Area*

The coastal occupation history of the Coast Tsimshian is discussed in terms of the distribution of known archaeological sites in the Prince Rupert Harbor, located on the northern coast of British Columbia. Using a multivariate approach, I identify patterns in site selection behaviors that emerged over the past 5000 years since sea level stabilization. These observations are analyzed using geographic information systems (GIS) to understand how these past human populations used and organized themselves on the landscape. This spatial analysis provides information on the development of certain subsistence practices and the environmental factors that influenced the placement of sites in the landscape including access to resources, productivity of resource areas, aspect, and beach quality. These factors are considered in relation to non-environmental factors such as defensibility, visibility, and proximity to other sites, which would have directed site location decisions during times of increased conflict. These general patterns in site characteristics are used to understand the agency of the settlement history in the Prince Rupert harbor area and identify areas of high research potential that have yet to be investigated.

Cooper, Martin [51] see MacDonald, Brandi Lee

Cooper, Catherine (University of British Columbia), Colin Smith (La Trobe University), Karen Lupo (Southern Methodist University), R.G. Matson (University of British Columbia) and Michael Richards (University of British Columbia)

[69] *Short Term Diet Change at Turkey Pen Ruins: Examining Stable Isotope Patterns in Archaeological Hair*

This poster presents the results of a dietary isotope study of human hair dating to the Basketmaker II period from the Turkey Pen Ruins site, Cedar Mesa, Utah. We sought to address the question of whether individuals from the Turkey Pen Ruins ingested maize directly through consumption of maize itself, or indirectly through the eating maize-fed turkeys, or a combination of both. We undertook bulk stable isotope analysis (carbon and nitrogen) and stable isotope analysis (carbon) of separated amino acids on ancient hair samples. By analyzing sequential segments of hair, it was possible to see short term changes in diet and the fluctuations in the proportions of what the Basketmaker II individuals at Turkey Pen Ruins were consuming year-round.

Cooper, Jago (Institute of Archaeology, UCL)

[167] *Insular Climatology in Island Archaeology: Comparative Perspectives from the Pacific and Caribbean*

Island communities represent some of the most vulnerable people

on the planet to the impacts of global climate change. A long-term perspective of human-climate-environment relationships is essential if the relative vulnerability of island societies to the different spatial and temporal scales of mid-to-late Holocene climate variability is to be fully understood.

In this paper, new and existing archaeological, paleoclimatic and paleoenvironmental data from Cuba and Rapa Nui are reviewed to demonstrate the contrasting human experience of climate variability and environmental change within the two distinct island theatres of the Caribbean and Pacific. This provides some interesting perspectives on how island ecology (flora, fauna, topography, geology) and changing human lifeways (food procurement, exchange networks, demography, architecture, ecological knowledge) affect the relative resilience of island communities to the climatic and environmental hazards they face.

Adopting this past human ecodynamics approach to studying the relationship between global climate change and island specific societal vulnerability provides the long-term perspective, and data-led case studies, necessary to enable the global change community to visualize and contextualize the threats of human induced climate change.

[254] *Discussant*

Cooper, Jason (AMEC E&I) and Tim Gerrish (AMEC E&I)

[276] *Low Reservoir Pool Levels behind Howard A. Hanson Dam Reveals Late Prehistoric Encampment along Green River, King County, Washington*

In Washington State, there has been a surplus of water behind the region's dams over the last decade, but due to recent leaking issues with the Howard A. Hanson Dam, southeast of Seattle in King County, the U.S. Army Corps of Engineers-Seattle District have needed to manage the reservoir pool level like it was suffering from drought conditions. As a result of managing the reservoir pool at low environmental levels, there has been an increase in erosion of previously documented prehistoric sites across the Howard Hanson Dam Archaeological District and an uptick in the number of newly identified sites. One recently exposed site (45KI1083), which dates to the Late Prehistoric, was excavated by AMEC in 2011 with intriguing results, including a robust faunal assemblage for a western Washington Cascade Mountain foothill locale.

Copeland, Steve (Crow Canyon Archaeological Center) and Caitlin Sommer (Crow Canyon Archaeological Center)

[184] *Seeing the Unseen: Geophysical Testing Techniques on Basketmaker III Settlements*

The Crow Canyon Archaeological Center (CCAC) is investigating a large Basketmaker III settlement in southwest Colorado in an attempt to understand early ancestral Pueblo communities. Salient to the Basketmaker Communities Project (BCP) is the assessment of population size and density through the identification of habitation structures across the settlement. To this end, multiple geophysical techniques were employed during the 2011-2012 field seasons. This poster presents only the electrical resistivity results, which covered approximately 14,880 m². Nearly invisible from the surface, Basketmaker III pitstructures and extramural features are difficult to detect with surface survey methods alone. Geophysical imaging allowed for the identification of numerous pitstructures, and in many cases, visualization of their shape and size. CCAC has used this information to target areas for excavation, reducing the BCPs impact on the archaeological record. These methods are applicable to the study of the Basketmaker III occupation in similar settings across the central Mesa Verde Region.

Corday, Connor [71] see Judd, Kathleen

Cordero, Maria-Auxiliadora (University of Pittsburgh)**[1] Chemical Analysis of Ecuadorian Ritual Vessels: Piartial Pottery**

Over the last few years I have analyzed a pottery collection at the Carnegie Museum of Natural History in Pittsburgh together with colleagues. A group of bowls affiliated with the Piartial complex of northern Ecuador displaying red overpainting led me to propose prehispanic curation of bowls associated with funerary rituals. This paper presents results of recent chemical and X-ray fluorescence analyses performed at the lab of Ecuador's Institute of Patrimony (INPC) on a number of Piartial vessels from a similar collection in Ecuador to determine whether the ideas proposed earlier about rituals of renewal derived from the Pittsburgh collection are supported.

[1] Chair

Cordero, Robin (Office of Contract Archeology, Univ. of New Mexico) and Sean Dolan (University of Oklahoma, Department of Anthropology)**[85] Mimbres Seasonality, Site Occupation, and Organization in the Sapillo Valley.**

The University of New Mexico Office of Contract Archeology has recently investigated two sites, a Late Pithouse and a Mimbres Classic phase occupation, at Lake Roberts in the Sapillo Valley of southwestern New Mexico. Since there has been less attention in this area of New Mexico compared to that of the more discussed Mimbres Valley to the south, the Sapillo Valley holds a wealth of information regarding Mimbres society and differences in population and social organization. This research looks at the evidence for seasonality and site occupation through the presence of open outdoor work areas, artifact assemblages, and agricultural developments in the Sapillo Valley between A.D. 750-1130.

Cordova, Carlos [162] see Bisson, Michael

Coronel, Eric [207] see Terry, Richard

Corrado, Kristi (University of Cincinnati)**[235] An Analysis of the Corriental Reservoir Volcanogenic Ash and Clay Sediment Deposits in Relation to Maya Land Management and Sustainability Practices in Tikal, Guatemala**

The controversy surrounding the sustainable practices of the Maya leads archaeologists to question the specific role and impact Maya agricultural and agroforestry practices had on the local environment. With reservoirs still intact since Maya occupation, these catchment areas have acted as essential pools of data accumulating both aerial and surface debris since their construction. Although previous research had been conducted concerning this issue of sustainability in the Maya area, this study specifically focuses on the analysis of volcanogenic and fluvial deposits extracted directly from Maya reservoirs. Each soil stratum acquired from these core profiles has provided layers of environmental information that are essential aids in reconstructing and understanding the ancient Maya local environments and climatic events. This geoarchaeological study examines the sediment composition of fourteen sediment cores from Tikal's Corriental reservoir. In order to illustrate the spatial relationship between these interpolated cores and the reservoir basin, the study uses a Fence diagram to present this data in the form of a digital 3D cross section. This paper explores the connection between reservoir sediment accumulation and whether or not these deposits exhibit indications of sustainable versus destructive land management practices.

Cortes-Rincon, Marisol (Humboldt State University)**[213]****Settlement Hierarchies, Population Estimates, Resource Specialization, and Political Complexity: Dos Hombres to Gran Cacao Archaeology Project (DH2GC)**

This paper will disseminate the results of recent interdisciplinary research, addressing topics such as religion, site and social hierarchy, settlement patterns, resource specialization, agricultural economics, and spatial analysis. Surviving structures can illustrate social hierarchy. Through architecture, the sites located on the Dos Hombres to Gran Cacao Archaeology Project (DH2GC) illustrate the existence of social stratification. Ground mapping techniques help to establish the variation of structures within and depict the size and complexity of the sites. Comparisons amongst each household confirm the dialectics between the common and elite. Using survey and site file data, this study models polity boundaries and regional integration through a Geographic Information System (GIS) based analysis and proposes a site hierarchy. The end result is a more informed rendering of prehistoric settlement and interaction, specifically as reflections of the operation of political economy.

[213] Chair

Costa, August (Indiana University), Jeff Illingworth (Mercyhurst Archaeological Institute), P. Ajithprasad (Department of Archaeology and Ancient History, Mah), K. Bhan (Department of Archaeology and Ancient History, Mah) and K. Krishnan (Department of Archaeology and Ancient History, Mah)**[147] New Perishable Traces from Shikarpur, a Classical Harappan Site in Kutch, Western India**

Cord and textile marked ceramics are often found in contexts associated with the Indus Valley (Harappan) civilization. However, systematic study of the perishable fiber technologies these traces signify has not yet occurred. We report on a small sample (n=33) of cord-marked sherds and one large textile impression discovered in ongoing excavations by the University of Baroda at Shikarpur, a coastal port and craft production center of the Indus civilization in Kutch, India. One plaited textile impression appears to be an accidental trace left from clothing or some other woven item. Cord impressions were observed on a variety of vessels sometimes near the rim and often in groupings of two or more. All cord markings exhibited the same two ply z-spun final s-twist formula. No knots were observed. It is unclear how these "cord rings" were manufactured and incorporated into these vessels. The significance of these cord-marked vessels remains unclear. Hypotheses of style and function are considered. The importance of ceramic impressions to South Asian perishable studies is highlighted.

Costin, Cathy (California State University, Northridge)**[59] Weaving Identities Deep and Broad**

Working from the premise that clothing signaled identity in the ancient Andean region, this paper begins by tracing similarity and change in tunic design and structure on the North Coast, using extant textiles and depictions of individuals wearing clothing from the Early Intermediate (Moche) period through the Late Intermediate (Sican and Chimu) periods to establish the depth of how indigenous identity was expressed in material culture. The paper then considers the organization of textile production, to determine how these identities were created and controlled. Finally, the paper explores how the conquering Inka expropriated and manipulated the production process for both cloth and pottery to foster new forms of social and political relations on the North Coast.

[59] Discussant

[59] Chair

Costion, Kirk E. [24] see Green, Ulrike

Costopoulos, Andre [215] see Wren, Colin

Cottier, John [6] see Lobiondo, Matthew

Cottier, John (Auburn University) and Cameron Wesson (Lehigh University)

- [29] *Big Sites, Big Questions, Big Data, Big Problems: Scales of Investigation and Perceptions of Southeastern North American Archaeology*

At least since the 1920s, archaeological investigations in Southeastern North America have placed a priority on expansive, near-complete, excavations of major sites in the region. Although there are many advantages for large-scale field research, such projects are also accompanied by a series of challenges in regards to the comparability, integrity, and consistency of recovered data. This paper examines the history of large-scale excavations in the Southeast and general views within the discipline that the region has contributed little to the "big questions" of American archaeology. Recently published analyses of decades-old data derived from Southeastern sites reveals both the positive and negative aspects of field research conducted at scales much larger than normally undertaken in archaeology.

Coupland, Gary [170] see Clark, Terence

Coupland, Gary (University of Toronto)

- [170] *Northwest Coast Household Archaeology: Twenty-five Years on down the Trail*

This paper reviews and celebrates the practice of household archaeology on the Northwest Coast. The contributions of Ken Ames to this endeavor, in particular his work at the Meier site, are highlighted. By placing the archaeological focus on the household, the primary socioeconomic unit of traditional Northwest Coast societies, Ames and others opened exciting new theoretical doors to a region whose archaeology had been largely devoid of theory. I trace the development of this movement from its beginnings in the early 1980s to the present, and I consider the effect that it has had on Northwest Coast archaeology in general.

Courtes, Valerie

- [4] *Discussant*

Cousins, Lynn [221] see Dawson, Peter

Coward, Fiona (Bournemouth University)

- [106] *Getting to Grips with the Very Earliest Social Networks: The Challenges of Using Network Methodologies to Tackle Paleolithic Datasets*

A series of recent analyses have demonstrated an expansion in the scale and complexity of social networks as larger and more permanent social aggregations grew up with the adoption of a more sedentary, village-based and ultimately agricultural lifestyle during the late Paleolithic and early Neolithic. However, these developments may represent only a relatively late stage in a much more long-term and gradual process of scaling-up of social networks which took place over the course of hominin and human evolution, from the small, intimate and highly local communities of other primates, to the globally-connected, city-dwelling Homo urbanus of the contemporary world. In this paper I will argue that increasing engagement with material culture was central to this process, providing a mechanism by which humans were able to expand the scale of social relations well beyond those of their closest relatives. Network methodologies provide the best

opportunity to investigate this; however, the nature of Paleolithic datasets makes such analyses challenging; in this paper I will discuss the problems and also some potential ways forward, through which we may be able to gain vital insights into some of the very earliest social networks and the ways in which they subsequently evolved.

Cowie, Hannah [219] see Littleton, Judith

Cox, Grant (University of Southampton) and Graeme Earl (University of Southampton)

- [9] *Computer Visualization of Çatalhöyük*

The original excavations of Çatalhöyük, headed by James Mellaart, produced a wealth of archaeological material. This included well-preserved wall paintings that spread throughout ten differing layers of habitation providing an insight into both the culture of its Neolithic inhabitants and the emergence of human sedentary society. In particular, a building uncovered in these early excavations was a highly decorated structure, nicknamed the "Shrine of the Hunters." It had four separate painted murals, spread across the entirety of the room. This made it one of the most ornate areas found to date at the site.

This poster describes research to produce a digital simulation of the paintings in context, as a means to stimulate further interpretation through visual exploration. The poster introduces the visualizations, the approaches and data employed, and the relationship between the visual representations, their construction and consumption, and the interpretative process.

Crabtree, Stefani [106] see Kohler, Tim

Crabtree, Stefani (Washington State University)

- [206] *Constructing Communities: Examining Household Aggregation in the American Southwest*

The Village Ecodynamics Project uses empirical research and modeling to understand factors influencing the settlement patterns of Ancestral Puebloan peoples. This original research explores social factors influencing settlement decisions among these populations, namely the effect of exchange on the aggregation or dispersion of households within the study area. I develop measures of the degree to which, and scales at which simulated households cluster in relation to surrounding simulated households. I apply these same measures to archaeological settlement data. Finally, I compare simulated clustering to real clustering of households on the physical landscape. Using two measures of spatial dispersion from ecology, the F/G statistic and the Index of Dispersion (or ID) statistic, I characterize the placement of households on both the real and simulated landscapes. These analyses help us understand the degree to which real households aggregated, and the comparison with the model is useful for ascertaining what environmental and social factors may have influenced the decisions of Ancestral Pueblos to live within communities.

Crabtree, Pam (New York University)

- [211] *State Formation in Anglo-Saxon England*

Bernard Wailes was a strong advocate for making the study of European medieval archaeology part of a broader anthropological archaeology. Wailes argued that the rich medieval data base, when combined with the historical and numismatic records, could shed light on processes of cultural change, including the rise of urbanism and state formation in the post-Roman west. Traditional models for urbanism and state formation in Anglo-Saxon England have focused on the control of international trade by emerging

Anglo-Saxon kings as a critical factor in the rise of the Anglo-Saxon kingdoms. However, more recent analyses suggest that the Anglo-Saxon kings may have profited through their ability to tax this international trade, rather than through the direct control of prestige goods. This paper will examine whether aspects of Pat Kirch's model for Hawaiian state formation can be applied to the Anglo-Saxon case. This paper will argue that agricultural intensification, along with political rather than geographical circumscription, may have played critical roles in the rise of the Anglo-Saxon state.

[211] *Chair*

Craig, Oliver [253] see Debono Spiteri, Cynthianne

Craig, Oliver (University of York, UK), Carl Heron (University of Bradford), Junko Habu (University of California, Berkeley), Mio Katayama Owens (University of California, Berkeley) and Yastami Nishida (Niigata Prefectural Museum of History)

[258] *Specialization in the Use of Hunter-Gatherer Pottery from Japan? Evidence from Lipid Residues*

The record of hunter-gatherer pottery in Japan which dates back to the end of the last glacial period and through the early and middle Holocene offers a unique opportunity for studying pottery use through a period of climatic, environmental and cultural change. Whilst the antiquity of the material provides a challenge for the recovery of organic molecules, the initial results are very promising and the next step is to reconstruct usage patterns across assemblages and to integrate these with the paleoecological and paleoenvironmental record. As well as the actual vessel contents, we want to know whether hunter-gatherer pottery was used selectively, contained mixtures and whether pottery use was tightly controlled/specialized. To this end, we will present data on the use of pottery from several early and middle Jōmon sites from Northern Honshu and discuss the role of pottery in hunter-gatherer subsistence specialization with reference to examples from other parts of the world.

Crandall, John (University of Nevada, Las Vegas), Jennifer Thompson (University of Nevada, Las Vegas) and Debra Martin (University of Nevada, Las Vegas)

[74] *Bundled Bodies in the Chichimec Sea: Transformations of Tepehuan Children through Mortuary Ritual in Ancient North Mexico*

Because mortuary rites represent moments of transformation for the human body, material culture, social relations and cultural ideals, they have long been a topic of research for bioarchaeologists. In particular, the study of mummification and treatment of bodies at and after death are topics of interest as these rituals shed light on the way past cultures conceive of the agency of the deceased's soul among the living. By focusing on the secondary treatment of dead children, mortuary archaeologists can understand the role children continue to play socially as their identities are transformed by death.

Here, we examine the secondary treatment of 18 complete Loma San Gabriel (~682-1150 AD) Tepehuan burials removed from a sacrificial cave site to understand the roles children's souls played in bridging the living with supernatural forces in ancient Tepehuan cosmology. The bundling and preparation of 8 non-adults in ritual belts, blankets, and reed mats as well as the re-use of the cave site are considered alongside artifactual, ethnographic and iconographic evidence to reconstruct the 'postmortem agency' of Tepehuan children after their bodies are transformed by mummification. Considerations of how this practice contrasts with larger regional bundling practices associated with the Tlaloc complex are also presented.

Crane, John [281] see Nelson, Shaun

Cranford, David (UNC-CH)

[81]

Household Variability in the Early Federal Period Catawba Nation

The household has long been recognized as an important nexus where social, behavioral and material components of culture are created, expressed and rearticulated through daily practice. Households offer an especially intriguing avenue of investigation during periods of dynamic social change such as the case of the late eighteenth century coalescent Catawba Nation. This approach is used to identify differences within and between Catawba settlements coping with the effects of severe population loss, encroaching white settlers, emerging capitalist markets, and geopolitical upheaval. Recent archaeological excavations have documented numerous domestic contexts associated with two largely contemporaneous early Federal period Catawba settlements identified as Ayers Town (34YK534) and Old Town (SoC 634). These sites have yielded evidence for multiple discrete clusters of domestic features that have been interpreted as households. Using ceramic, spatial, and historical data, I will examine the distribution of ceramic and other artifact classes among the various household clusters in order to better understand the nature of Catawba household variability within and between these communities.

Crawford, Dawn (Southern Methodist University), Brigitte Kovacevich (Southern Methodist University) and Amanda Thornton (Southern Methodist University)

[204] *Experimental Jade Polishing: Replication of Ancient Maya Techniques*

Many jade polishing techniques are cited in Old and New World ethnographic and ethnohistoric accounts including the use of leather, wood, bamboo, emery, slate, and other stones. Archaeological evidence that is emerging from Maya sites indicates that limestone polishers may have been used in some cases, possibly with an abrasive. Soil chemistry has demonstrated the presence of iron in conjunction with some jade working surfaces, possibly suggesting the use of hematite powder (often a component in modern jeweler's rouge) may have been a polishing agent. This research will attempt to replicate some of these techniques and test their efficiency.

Crawford, Gary (University of Toronto)

[212] *Niche Construction in the Post-Pleistocene Lower Huanghe Valley of North China*

Human-plant interaction at the onset of food production in North China provides insight to the complexities of human ecology in the post-Pleistocene Lower Huanghe valley. This paper uses archaeobotanical data from the Houli culture period to the late Longshan period as a foundation in order to inform a broader discussion of human-environmental interaction and niche construction. The Houli culture is the first clear manifestation of a food producing population in Shandong Province while the Late Longshan population was a well-established complex society. The Late Longshan built on a foundation of ecological engineering that began during Houli times at least 4000 years earlier.

Creamer, Winifred (Northern Illinois University), Winifred Creamer (Northern Illinois University) and Jonathan Haas (Field Museum)

[50] *The Agricultural Foundation of Andean Civilization*

Recent analysis of materials from Late Archaic sites (3000-1800 cal BC) on the coast of Peru yields a consistent body of evidence showing that emergence of Andean civilization in South America was based on cultivation and consumption of agricultural resources. The prevalent notion that early Andean civilization was different from other world areas because of a reliance on marine rather than agricultural resources is refuted by an assemblage of data drawn from pollen profiles, coprolites and stone tool residues. These new data, supported by over 200 radiocarbon dates, show that the Late Archaic diet was based on the production and consumption of maize and other domesticated plants. The economic foundation provided by plant domestication in emergent

Andean civilization shows that the region was not an exception to a global pattern, but fits well into broad, agriculturally based, cross-cultural models of state formation.

[50] *Chair*

Creamer, Winifred [50] see Creamer, Winifred

Creaser, Robert [79] see Leslie, Brian

Creekmore, Andy (University of Northern Colorado)

[75] *Evaluating the Application of Multiple Archaeological Geophysics Methods to a Numic site in North Park, Colorado*

High Plains and Rocky Mountain Numic sites often consist of a palimpsest of multi-component cultural remains left over extended time, including hearths, roasting pits, middens, activity areas, and other features. The size, period of occupation, and feature types at such sites are generally characterized or assessed via surface survey, shovel test pits, and block excavation. This paper explores less invasive assessment methods including magnetometry, resistivity, and ground-penetrating radar, combined with soil cores, applied in an exploratory study of site 5JA421 in Ballinger Draw, North Park, Colorado. The site has evidence of multiple cultural period occupations, its most prominent occupation being a series of seasonal, short-term and stratified prehistoric Ute (Numic) camps radiocarbon-dated from AD 1100-1400. The goal of this work is to begin to define geophysics data correlates for archaeological and geomorphological features of Numic-associated, ephemeral camp sites in North Park and the Front Range. Although the usefulness of geophysics methods at any given site is dependent upon local geology, soil moisture and properties, and feature types, it is expected that multi-method geophysics surveys will provide robust data sets useful for examining site formation, site structure, forager behavior and targeting productive site locations for subsequent testing and excavation.

Creese, John (University of Cambridge)

[124] *Making Pipes and Social Persons at the Keffer Site: A Life History Approach*

Studies of pipe smoking in the eastern Woodlands have focused on two important themes: inter-polity diplomacy and shamanism. Among the Iroquoian societies of southern Ontario, however, pipe smoking was a ubiquitous practice that played an important role not only in shamanic or diplomatic contexts but also in people's everyday lives. This paper reports an intensive contextual study of nearly 600 pipes recovered from the 15th-century Keffer village site. This robust sample provides important insights into the diversity of artifact biographies possible for different pipes. Particular attention is paid to the way pipe fabrication, modification, and fragmentation patterns are closely connected to the production of the self vis-à-vis wider social categories. Compared with contemporaneous ceramic technologies, pipe making and using seems to have been associated with a greater degree of personal choice, and a wider range in skill levels and finishing techniques. Moreover, pipes at Keffer were extensively curated and modified to maintain function, and were occasionally recycled into beads and pendants. Arguably, the intimate associations built up between pipe and personal life histories through these practices made pipes inalienable possessions – exchanged in diplomatic contexts precisely because they carried with them a sense of the unique persona of the giver.

Crellin, Rachel (Newcastle University (UK)) and Andrea Dolfini (Newcastle University (UK))

[98] *Metals under the Microscope: Use-Wear Analysis on Prehistoric Copper Alloy Objects*

Use-wear analysis on copper-alloy objects is a developing field. The application of traditional microscopy techniques enabled greater exploration of the life-histories of these defining objects of the European Bronze Age. Previous analysis of copper-alloy objects was limited to their production and deposition histories often resulting in polarized interpretations of objects as commodities or votive offerings. There has been a reluctance to analyze metals using similar methods to those applied to flint, polished stone and bone due to issues of recycling, re-sharpening and post-depositional processes – whilst all these factors pose limitations, analysis has produced promising results and shown that important questions can be addressed. Use-wear techniques have allowed archaeologists to explore more thoroughly hammering, grinding, casting and polishing of tools as part of production processes. Marks visible on cutting edges include, nicks, cracks, deformations, scratches and striations which, alongside blunt-ness and asymmetry enable an enlivened life-history including use, polishing and hafting and to be explored. Post-depositional processes can also be considered. This paper will discuss and explore the method using examples of Bronze Age axes from the Isle of Man and highlight the future potentials and pitfalls for comparison with earlier polished stone axes; something yet to be systematically explored.

Crema, Enrico (UCL -Institute of Archaeology-)

[23] *An Abstract Model of Endogenous and Exogenous Fission-Fusion Dynamics*

Variations in human settlement pattern emerge from repeated episodes of group fission and fusion. These events can be induced by exogenous changes in the environment or internally emerge from the system as a cumulative result of the interactions of its components. The purpose of this paper is to develop an abstract agent-based model of metapopulation change that captures the essence of the phenomenon, transcending the specifics and the idiosyncrasies of given settlement transitions. I argue that human groups are generally characterized by both positive and negative frequency dependence selection; increasing group size has beneficial effects up to a certain point, when detrimental forces start to predominate and being part of a group is no longer a viable strategy. Such a relationship has evolutionary implications in human metapopulations once individuals have the possibility to modify their conditions through fission-fusion dynamics. I will first explore the equilibrium properties of these dynamics and establish which variables play pivotal roles. I will then explore the consequences of two types of disturbance processes, one where resource availability is affected by the behavior of the agents (e.g. overexploitation) and one where external forces (e.g. climate change) are induced to the system.

Crenshaw, Joan C. [57] see Wyatt, Andrew

Crider, Destiny [288] see Nichols, Deborah

Cristiani, Emanuela [80] see Boric, Dusan

Cristiani, Emanuela and Dusan Boric (Department of Archaeology, Cardiff University, Hum)

[250] *Ground Stones and Mesolithic Lifeways: Techno-Functional and Residue Studies from South-East Europe*

Ground stones are an important and widespread category of prehistoric artifacts. The study of these implements allows interpretations with regard to both profane and symbolic activities. Although ground stones have often been associated with the beginnings of the Neolithic, and the intensification of plant use, it has recently been proved that ground stone implements had an important role long before the plant domestication. This paper focuses on ground stones of Mesolithic sites located in

the Danube Gorges (Central Balkans). During the Early Holocene this region was inhabited by communities of complex fisher-hunter-gatherers whose economy was mainly based on fishing migratory species of sturgeon and other fishes along with hunting of forest game. Little is known about the role of plants in the life of these communities due to poor preservation of plant remains. However, the study of ground stones can provide an indirect evidence to understand the role of plant foods in the diet of these communities. An integrated techno-functional and residue approach has been applied to ground stones from the sites of Vlasac and Lepenski Vir. Functional signatures, starches and residues offer insights into the role of ground stones in the life of Mesolithic groups of the region.

Critchley, Zachary (Franklin & Marshall College)

- [108] *Textile Production and Distribution at Panquima*

My paper will be on the craft production, specifically the production of textiles, at the Peruvian site of Panquima. Located in the Lurin valley, Panquima was a multicomponent site inhabited during the Late Intermediate Period (LIP). Excavations at the site over the years have yielded quantities of textiles and textile production utensils, and it has been proposed that craft production was undertaken by independent households--as opposed to the specialized, elite-sanctioned craft production seen in other Andean cultures.

I am going to address this subject using data that has been gathered from the excavations done at Panquima, including the 2012 excavations, as well as comparative studies of the rest of the Lurin valley and other culturally similar areas, such as other sites inhabited during the LIP. Information collected from different sectors of the site, representing different functions and residency patterns, will also be analyzed and comparatively studied in order to determine the origins and eventual destinations of finely made, as well as utilitarian, textiles, spindle whorls and other tools and materials relating to textiles and their production.

Cromb  , Philippe [28] see Robinson, Erick

Cromb  , Philippe (Ghent University, Department of Archaeology) and Erick Robinson (Department of Archaeology, Ghent University)

- [291] *Dates as Demographic Proxies in Neolithization Models of Europe: A Case Study from Belgium and Northeast France*

This presentation evaluates the use of summed probability curves as demographic proxies in models of the Mesolithic-Neolithic transition of Europe. We focus specifically on the lack of critical appraisal of (1) Mesolithic dates used in these models and (2) factors other than population densities that could be influencing summed probability curves (i.e. taphonomic variability, survey and research bias, variability of Late Mesolithic and Early Neolithic settlement organization and land use). Data from Belgium and northeast France are used as case studies. We question the proposed decrease in Late and Final Mesolithic populations before the arrival of Early Neolithic Linearbandkeramik farmers in these regions.

Cromwell, Robert (NPS-Fort Vancouver NHS)

- [261] *Comparing the Ceramics of Early-19th Century Fur Trade British Fort Sites along the Columbia River*

This paper presents a comparative typological analysis of early-19th century British and Chinese ceramic wares imported into the Pacific Northwest through the British North American terrestrial fur trade. Specifically, it compares the archaeological ceramic assemblages from the Northwest Company's Fort Okanogan (ca. 1811-1821), Fort Spokane (ca. 1810-1821), Fort George (ca. 1811-1821) and the Hudson's Bay Company's Fort Vancouver (ca. 1825-1860). All of these posts were supplied from England via a

precarious ocean based sea route of over 17,000 miles, and in the case of posts such as Fort Okanagan and Fort Spokane, up to an additional 300 mile up-river and overland portage. This study helps to reveal the extent of which early-Victorian ideals gave precedence to the supply of British-manufactured goods to colonial outposts on the opposite side of the world, and what the presence of these ceramic wares may reveal about the socio-economic statuses of the occupants of these forts.

Crook, Penny (La Trobe University), Shawn Ross (University of New South Wales), Adela Sobotkova (University of New South Wales) and Brian Ballsun-Stanton (University of New South Wales)

- [185] *The Federated Archaeological Information Management System Project (Australia)*

This paper presents a new Australian-lead international initiative in digital archaeology: the Federated Archaeological Information Management Systems (FAIMS) project, funded by the National eResearch Collaboration Tools and Resources (NeCTAR) program, an Australian Government grant program that funds improvement of Australian e-research infrastructure. The FAIMS project was awarded nearly \$1 million to build an open-source information system for archaeology that uses flexible, robust, and extensible data and metadata standards, and employs those standards to a range of components for acquiring, archiving, publishing and federating archaeological data. The goal of the FAIMS project is to begin the creation of an open-source ecosystem to unite many single-purpose components, some built by the project, others developed independently. This presentation will communicate the status of the project, including the outcomes of stocktaking workshop held at the University of New South Wales, Sydney, Australia, 16-19 August 2012, and the development plan produced afterwards. Key elements of this plan will include the development of mobile device applications for the creation of new digital data in a manner that facilitates dataset exposure, technical interoperability, and semantic compatibility, as well as development of federation strategies for legacy data available online, in concert with similar North American initiatives.

Crossland, Zo   (Columbia University)

- [56] *Fieldwork in the Efitra of Madagascar's Midwest. Preliminary Results*

Henry Wright has carried out groundbreaking research in a variety of contexts in Madagascar, including undertaking some of the first survey and excavation on the central western coast. Little is known of how this western area was articulated with the central highlands, the region where the powerful Merina state emerged under King Andrianampoinimerina at the end of the 18th century. This paper outlines the results of small scale survey carried out in Madagascar's empty wilderness or 'efitra' of the Middle West, a sparsely inhabited zone between the highlands and the western coastal region. Preliminary results suggest that the area was depopulated towards the end of the second millennium CE alongside an increase in slave raiding practices and the development of new social and political formations in the highlands and on the coast.

- [134] *Discussant*

Crowder, Christian [193] see Warnasch, Scott

Crowell, Aron (Smithsonian Institution) and Wayne Howell

- [137] *The "First War": Time, Oral Tradition, and Archaeology at a Tlingit Fort in Southeast Alaska*

Archaeological and geological evidence are applied to date and verify Tlingit oral narratives concerning Xakwoow  , an 850 year-old fort in the Glacier Bay region of southeastern Alaska. The site is narratively linked to the migrations of clans and the origins of Tlingit warfare, and remains a landmark of historical consciousness for contemporary descendants. The study reveals

substantial convergence between scientific data and oral tradition, the former providing a chronological and paleoenvironmental frame for the latter, which offers the rich cultural and historical specificity that can only be conveyed through time by language.

Crowley, Erin (University of Wisconsin-Milwaukee)

[96] *The Changing Role of Children in Roman Britain: New Directions for Future Research*

Archaeological investigations into the late pre-Roman Iron Age/Early Roman and Romano-British periods in Dorset, England have revealed changes in burial practices that appear to represent a shift in the concept of identity, especially with respect to gender and age, after the arrival of the Romans. The mortuary treatment of subadults indicates that their role in society changed during this period. This paper will utilize data generated by research conducted by Dr. Christine Hamlin (UW-Milwaukee) in thirteen Dorset area cemeteries from the pre-Roman through the early Christian periods. An analysis of the potential of the age-related data for understanding the complex relationship between age and gender in this region will be presented.

Cruz Berrocal, María (Instituto de Historia, CCHS, CSIC)

[95] *The Seventeenth-Century Spanish Colony of Hoping Dao, Taiwan*

In this paper, we will present an overview of our ongoing archaeological project in Hoping Dao, Taiwan. According to historical written sources, a Spanish colony was founded here in 1626. Our project seeks to contrast and enlarge the information provided by this type of evidence with an archaeological study that comprises the entire colonial space.

Starting from the local scale -the excavation of the Spanish colonial post and the annexed settlements- we aim at understanding the social mechanisms that guided daily life interactions and their long-term consequences. We will draw specific attention to the rich amalgam that co-existence between Europeans, Taiwanese native people (themselves extremely diverse and complex), Chinese and Japanese traders, Filipino soldiers and slaves of different geographies represented. Particular stress will be paid to situate the Taiwanese case -which has so far received scant attention- in the global scenario, as an extremely valuable contribution to the knowledge of multi-range transformations in trade and cultural exchange that begun in the 17th century.

[95] *Chair*

Cucina, Andrea (Universidad Autónoma de Yucatán), T. Douglas Price (University of Wisconsin, Madison), James Burton (University of Wisconsin, Madison), Evelia Magaña (Universidad Autónoma de Yucatán) and Augustin Peña (Centro INAH Yucatán)

[37] *Dental Morphology and Sr Isotope Analysis of Population Dynamics in the Ancient Maya Classic Period: the Case of Noh Bec, Yucatan, Mexico*

Inland Maya were characterized by complex exchange systems that operated through roads networks. Recent scholarship has questioned to which extent material exchange might attend high population mobility. This study analyzes dental morphological traits and Sr isotope ratios from Noh Bec, a large Classic trader community in the center of the Yucatecan peninsula, once nested strategically along an important inland trade corridor. Dental traits inform regarding morphological affinities among human populations, while Sr isotopes detect the presence of "foreign" born individuals in a skeletal collection. In contrast to other Prehispanic peninsular populations, the results from multiple statistical analyses of dental morphological traits highlight the absence of a clear pattern of biological affinity with coeval sites in the peninsula. Noh Bec's population clusters with different samples depending on the statistical procedures used, reflecting the collection's heterogeneity and internal biological variability. Sr

isotopic data strengthen this assumption by showing that all thirty-two individuals analyzed present dental Sr ratios deviating from the expected local signature, indicating that the sampled individuals were born in several different parts of the peninsula. Our joint results attest highly mobile trader groups, which refute present notions of home based, essentially stationary Maya inland trader communities

Cucina, Andrea [46] see Tiesler, Vera

Cui, Jianfeng [249] see Hung, Ling-yu

Culleton, Brendan J. [68] see Zavodny, Emily

Culleton, Brendan (The Pennsylvania State University), Douglas J. Kennett (The Pennsylvania State University) and David Hurst Thomas (American Museum of Natural History)

[291] *Gatecliff Shelter: A Bayesian Analysis of the Radiocarbon Chronology*

Gatecliff Shelter (Nevada)—one of the deepest rockshelters in the Americas—contains more than 10 meters of tightly stratified sediments. These remarkably rich cultural assemblages span the post-Mazama era (post-7700 cal BP), defining more than a dozen distinct living surfaces. Seventy radiocarbon dates on cultural material are presently available from Gatecliff Shelter, including 17 high-precision AMS dates recently processed for the present study. This paper demonstrates the utility of the Bayesian statistical environment to combine chronometric and stratigraphic evidence, to improve the precision and accuracy of site and regional chronologies, and to develop and test alternative chronological models.

Culley, Elisabeth (Arizona State University)

[147] *An Experimental Investigation: The Effects of Recovery Methods on Use Wear*

Archaeologists often wet-screen materials in the field in order to recover extremely small or sediment-encrusted artifacts that can be difficult to see and would otherwise be discarded. The recovery technique is essential in brecciated or compacted sediments where workers must submerge, stir, agitate, and break apart deposits to access materials, and yet the aggressive approach could damage the micro- and macromorphology of stone tools. Prehistoric use wear seems particularly vulnerable to alteration during the wet-screening process. This pilot study considers the effects of different wet-screening techniques on experimental use wear patterns and, therefore, the potential misidentification of use wear in the archaeological record. Similarities between use wear and screen damage are also evaluated. The analysis indicates both the "simple agitation" and more "aggressive manipulation" of artifacts under water has the tendency to chip, polish, and obliterate use wear made from cutting and scraping elk meat and hide. Interestingly, "simple agitation" caused the most damage to use wear and appears the most problematic for our understanding of prehistoric economic behaviors.

Cummings, Linda [236] see Clement, Beverly

Cunnar, Geoffrey [148] see Estes, Mark

Cunningham, Jeremy (The University of Lethbridge)

[24] *Recentering Peripheries: Domestic Production in Paquimé's Hinterland.*

The primate center of Paquimé has long been considered the transition between Mesoamerican and Southwestern communities. Within the Chihuahua Culture itself, sites outside Paquimé's core zone have generally been interpreted as passive receptors of

Medio Period cultural developments that appeared first at Paquimé. In this paper, I report the results of four years of field research in the Santa Clara Valley, which is located on the southeastern margin of the Casas Grandes regional system. I suggest that the Chihuahua Culture be understood as a heterogeneous social field and argue that analyses of domestic production are now needed to understand the transition from the Viejo to Medio Periods. To make my case, I describe the recent excavation of a late-Viejo period pithouse from the site of Ch-240 that appears to have been a center for ceramic production.

Cunningham-Smith, Petra (University of Florida), Arlen F. Chase (University of Central Florida) and Diane Z. Chase (University of Central Florida)

[69] *Fish from Afar: Marine Resource Use at Caracol, Belize*

The ancient Maya had strong ties to the sea. Marine resources were important not only to coastal Maya communities, but also to the heavily populated cities that lay many miles inland. A review of zooarchaeological evidence recovered from excavations at the inland site of Caracol, Belize suggests that the inhabitants imported marine fish for food, marine shell for working into trade items, and a wide variety of marine items, such as sharks teeth and stingray spines, for ritual use. This research examines the manner in which fish and other marine resources were used, procured, and transported from the coast to the site of Caracol. The possibility that certain marine fish might have been transported alive to the site is explored. Present-day fishing and animal husbandry practices suggests that many species could have survived an inland trip in ancient times, if transported under conditions that allowed for water exchanges and minimized stress. Marine resources had economic and ritual significance to the people of Caracol and acquiring them would have necessitated external connections. Understanding how these valuable items came to inland Maya sites is important for viewing economic and socio-political relationships among ancient Maya polities.

Curry, Ben (University of Arizona)

[206] *Towards a Landscape History of Wilder Ranch: An Archaeological and Historical Examination of the Social and Ecological Landscape Changes of a Nineteenth- to Twentieth-Century Ranch*

Wilder Ranch State Park, in central coastal California, preserves both the lands and built environment of a nineteenth century ranch established during the Mexican Period. During most of the late nineteenth century cattle ranching was a major component of California's economy. Ownership of the large tracts of lands allocated to ranching became the grounds of contention between earlier Hispanic settlers and U.S. pioneers, while the cattle themselves came to wreak havoc on the California landscape. This poster explores the interrelated social, economic, and ecological processes that altered the landscape of Wilder Ranch over the last 180 years. Previous historical analysis, archaeological research, and ecological studies on this ranch are summarized, and combined into a comprehensive framework for examining a ranch as a bounded landscape. This framework is intended to direct future work on Wilder Ranch as a holistic project that can integrate the history of land use, sociocultural and political changes, and landscape evolution that have produced the modern form of this ranch. The primary issue this framework is being constructed to handle is how to study a bounded landscape in which most of the evidence of its history is expected to be ephemeral and scattered over a large area.

Curtis, Tiffany (University of Alaska Anchorage)

[137] *Dendrochronology on the Kenai Peninsula, Alaska: Dating Historic Structures Using Tree-ring Analysis*

While the historic settlement of the Kenai Peninsula is understood in general outline, key aspects of the processes by which interior parts of the peninsula were colonized and exploited have

remained vague on account of historic documents being both voluminous and preferentially preserved for urban settlements. This particular area of Alaska experienced many interesting but little understood events during the American period such as the Gold Rush and also the advent of Homesteading. There is also a rich cannery history in this area as well as attempts at fox farming. From an archaeological perspective, however, the partial survival of more than 100 trapper cabins and mining structures provides opportunities for enriching the understanding of frontier processes and livelihoods. This paper explores this potential by examining wood samples taken from 64 cabins located in the Kenai Wildlife Refuge, Soldotna, Alaska. The intent, through dendrochronology, is to establish construction dates for each of the structures, and from which to model settlement processes at an intimate level of detail.

Curtis, Matthew [208] see Stretton, Sean

Cutright-Smith, Elisabeth (University of Arizona)

[262] *Ancestral Hopi Landscape Archaeology in the Homol'ovi Region and Implications for Hopi Off-Reservation Cultural Resources Management*

While the prehistoric settlement history of Homol'ovi State Park (HSP) has been thoroughly documented by 25 years of field research conducted by Homol'ovi Research Program archaeologists, the Cottonwood Wash drainage to the east of HSP has not been systematically surveyed or recorded. This research investigates this largely unstudied drainage near what is presumably the eastern boundary of the late Pueblo III-Pueblo IV period Homol'ovi Settlement Cluster and integrates data derived from a 2000-acre pedestrian survey within and adjacent to Cottonwood Wash with existing HSP survey data and geological, hydrographic, topographical, and floral data within a GIS environment to identify physical structural parameters of the archaeological landscape. I use Hopi ethnographic and cultural consultant data to situate the Homol'ovi region and the archaeological sites contained therein within the larger context of the Hopi cultural landscape, which is informed by Hopi migration traditions, traditional knowledge, and past and current cultural practices. In light of the fiscal uncertainty that threatens the protection of Homol'ovi sites via the State Parks infrastructure, I consider the implications that federal and state cultural resources legislation and judicial decisions have for the preservation and management of off-reservation cultural resources by states, federal agencies, and Indian tribes.

Cvijovic, Petar (Columbia University)

[134] *Islands of Splendor and Decay: Jewish Ruins in South-Eastern Poland*

Thousands of Jewish ruins amidst towns and villages in south-eastern Poland bring to mind desolated islands cut off from their surrounding by protective fences and locked gates. It would appear that many derelict synagogues and cemeteries have lost any function other than as visual curiosities attracting the gaze of occasional visitors. Yet, ruins are places teeming with non-human life, hybrid spaces where materials, plants, animals, and people are enmeshed together forming alternative urban aesthetics, actions, and experiences. A hidden flow of life and matter unfolds within their lingering walls, transforming these islands of stone and rubble into a secluded space that blurs the boundaries between the past and the present.

Cyr, Howard (University of Tennessee), Esther Rimer (University of Tennessee), Kandace Hollenbach (University of Tennessee) and Keith Little (Tennessee Valley Archaeological Research)

[284] *It's the Little Things That Count: The Importance of Multiproxy Data in the Reconstruction of Site Histories at the Widows Creek Site, Alabama*

Originally excavated in 1972, Widows Creek (1Ja305) is a multi-component site located on the Tennessee River in Jackson County, Alabama, with cultural deposits spanning the Early Archaic (ca. 10,000 B.P.) through the Mississippian (ca. 800 B.P.) periods. A recent study of sediment samples curated during the initial excavation was carried out to better understand changes in the cultural and natural stratigraphy and the potential influence of one upon the other. A comparative analysis of microartifact, sedimentologic, geochemical, and macrobotanical characteristics has yielded new information concerning changes in the nature, timing, and intensity of human habitation at Widows Creek as well as the influence of changing environmental conditions on site occupation and the effects of site formation processes on stratigraphic characteristics. In addition to demonstrating the importance of multi-disciplinary research to the answering of archaeological questions, this study highlights the usefulness of analyzing curated samples collected from previously excavated sites.

Daggett, Adrienne (Michigan State University)

[153] *Early Iron Age Economy at Thaba di Masego, Botswana*

This paper will present preliminary findings from the 2012 field season at Thaba di Masego, an Early Iron Age site in northeastern Botswana. This hilltop settlement was part of a regional network of settlements along the margins of Sowa Pan from roughly 800-1000 A.D., and growing evidence of long-distance exchange and goods manufacturing suggests that settlements in this area were part of an extensive southern African trade system during this time period. Finds from Thaba di Masego will contribute to an understanding of the Early Iron Age as a socially and economically dynamic period in southern Africa's prehistory.

Da-Gloria, Pedro [217] see Kipnis, Renato

Da-Gloria, Pedro (Universidade de São Paulo, Departamento de Genética e Biologia Evolutiva) and Clark Larsen

[272] *Health and Lifestyle of the Paleoamericans of Lagoa Santa, Brazil*

The Lagoa Santa skeletal series from Central Brazil contains 195 human skeletal individuals dating to the Early Holocene (ca. 10,000-7,000 yBP), allowing a rare opportunity to document Paleoamerican health and lifestyle. We test the hypothesis that prevalence of osteological markers of health and lifestyle in Lagoa Santa are more similar to general patterns identified in foragers than farmers. For comparison, we use the Western Hemisphere Project (WHP) database (n=6,733; 36 sites) from across the Americas. Compared with foragers from the WHP database, Lagoa Santa individuals show high prevalence of dental caries and abscesses, osteoperiostitis, osteoarthritis, and trauma due to interpersonal violence, but low accidental injury and more circular femur shape. We interpret that Lagoa Santa Paleoamericans consumed a high-carbohydrate diet, were exposed to infection, had low mobility and generally engaged in high levels of physical activity involving low risk behaviors relating to accidental injury. Evidence of cranial trauma suggests presence of non-lethal injury relating to domestic violence. These results are inconsistent with traditional models of first Americans as small and highly mobile bands having protein-rich diets based on exploitation of large game animals. Rather, Lagoa Santa bioarchaeological analysis reveals a population expressing an early adaptation to a tropical setting.

Dahlstedt, Allisen (Arizona State University) and Paul Goldstein (University of California, San Diego)

[238] *Sacrifice and Ancestor Veneration in a Tiwanaku Temple: An Exploration of a Commingled Human Dedicatory Offering at Omo M10*

Human remains in the prehistoric Andes hold significance long after an individual's death. At the type site capital of Tiwanaku, human dedicatory offerings in monumental contexts represent both human sacrifices and carefully curated ancestors. Whether such offerings represent elite displays of power or the embodiment of community identity is contextually dependent and a subject of debate. The current investigation explores the significance of a Tiwanaku human dedicatory context recently excavated from a ritual precinct of the Tiwanaku temple of Omo in the Moquegua Valley of Peru. The unique placement of this commingled inhumation within a patio associated with numerous camelid interments indicates a ritualized context likely to have been used for dedication or sacrifice events. We examine 156 semi-articulated human dental and skeletal elements from a single commingled interment within an Omo temple patio, providing age, sex, and MNI estimates. Taphonomic analysis is performed on these remains to identify evidence of peri- or post-mortem cut marks, crushing, or breaking associated with the dismemberment or defleshing of dying or recently dead individuals. The results of these analyses are compared to sacrificial and dedicatory contexts from highland Tiwanaku monumental architecture. Various scenarios of primary and secondary interment are evaluated.

Dai, Xiangming

[66] *A Comparative Perspective of the Beginning of Early States in Central China*

With an emerging consensus that treats Erlitou as a state-level society, there has been an increasing number of projects to investigate whether there were earlier states than Erlitou in central China. The extant evidence in Henan Province is disappointingly inadequate to support these efforts. However, the situation is drastically different in southern Shanxi province where a few super-large sites are found. Among these sites, Taosi (300 ha) stands out as the most notable settlement. In this paper I attempt to offer a comparative perspective between Taosi and Erlitou, and in doing so I will also contrast the differences between Taosi and its contemporaneous neighbors in central China. I argue that Taosi was likely the earliest state in Central China.

Dain-Owens, Anne [183] see Baxter, Carey

Dalan, Rinita (Minnesota State University-Moorhead), Steven De Vore (National Park Service, Midwest Archeological Center) and Bruce Bevan (Geosight)

[34] *Archaeological Prospection Advances for Non-Destructive Investigations: Contributions of the National Park Service Workshop*

The National Park Service workshop on archaeological prospection is an annual, week-long series of lectures and field exercises providing training in the archaeological application of geophysical, aerial and other remote sensing methods. Its volunteer instructors have trained hundreds of archaeologists on sites across the U.S. Established in 1991, it is not only the longest-standing such course, but it has trained the broadest base within the archaeological community. Key aspects of the workshop include the varied backgrounds and interests of participants and instructors, a low student-to-instructor ratio, and workshop sites of different ages, types, and conditions. Course evaluations show that the quality of instruction, interaction between instructors and participants, field exercises, and training materials provided have been central to the success of the course, although improvements in organization and instruction can still be made. In addition to training, the course has created a community of practitioners, providing opportunity for professional development, mentoring, and collaborative research and development efforts. A significant amount of primary data has been generated. As an integral part of broader National Park Service efforts, the workshop has played a major role in development of geophysical methods in archaeology in the U.S. and beyond.

Dalan, Rinita [34] see Hargrave, Michael

Daley, Justin [187] see Meyers, Cory

Daley, Justin (Indiana University of Pennsylvania)

[187] *The Development of Ship Construction in Nineteenth-Century Pittsburgh*

The city of Pittsburgh, Pennsylvania has long played a pivotal role in the development of numerous modern industries. It has been dubbed the Iron City, Coal City, Steel City, and Glass City to name but a few of its sobriquets. However, the first major industry established in Pittsburgh was that of ship construction. The focus of this research is the development of ship building in Pittsburgh from its inception in the latter part of the 18th century through its evolution in the 19th century. This research also seeks to explore ship building's vital impact in western inland rivers. Among the questions discussed in this investigation include: Where were ships built? Who built them? What types were built? Why were they built? And how have the shipyards been absorbed into present day Pittsburgh? This last question represents the primary archaeological component to this research, as an examination of each of the former shipyards will entail an evaluation of its future research potential.

Dalmeri, Giampaolo [291] see Naudinot, Nicolas

D'Alpoim Guedes, Jade (Harvard University)

[66] *Adaptation and Invention during the Spread of Agriculture to Southwest China*

Despite the important role that Southwest China played in agricultural history in historical times, the spread of agriculture to this region occurs relatively late. Southwest China is ecologically diverse and contains a variety of different ecosystems including the northern foothills of the Himalaya, the rugged landscape of the Yunnan-Guizhou plateau and the Three Gorges, and the low lying plains of the Sichuan Basin. Using ecological niche modeling, this study outlines the constraints and challenges faced by the ancient farmers who moved agriculture into these new environments and highlights the strategies they used to meet these challenges. We argue that contrary to prior expectations, not only rice, but also millet agriculture played an important role in how this spread occurred. In particular, we argue that environmental factors coupled with the biological characteristics of these two different crops, had profound effects on the development of social complexity in the region. In low-lying regions that provided the necessary ecological conditions for its success, rice agriculture could be intensified, spurring population growth and inevitably social change. Millets, on the other hand, were important for moving agriculture into the cooler and more difficult to irrigate uplands of SW China.

Damblon, Freddy [207] see Nigst, Philip

Damick, Alison (Columbia University) and Marshall Woodworth (University of Oxford)

[227] *The Steatite Micro-beads from Tell Fadaous-Kfarabida: A Case Study in Early Bronze Age Technology and Trade in Northern Lebanon*

This paper presents the results of analysis of seven Early Bronze Age stone micro-beads from Tell Fadaous-Kfarabida in northern Lebanon, six of which have been identified as glazed steatite via EDX and XRD analysis. Although interest in the identification and analysis of proto-historic micro-beads has recently increased, they remain an under-examined category of material culture in the coastal Levant. However, studies over the past decades demonstrate that micro-beads have the potential to reveal important information about issues as diverse as early technology, long-distance and local trade, and the social contexts of personal

adornment and craft production.

Tell Fadaous-Kfarabida was continuously occupied from the fourth-late third millennia, and was subsequently largely abandoned, offering a unique opportunity to observe early urban contexts without later intrusions. This analysis is the first such study undertaken for Lebanese material, and therefore offers an important opportunity for discussion and comparison with other regional studies. Although most case studies of steatite and synthetic enstatite come from fourth millennium contexts, earlier than the material presented here, the study of the beads from Tell Fadaous-Kfarabida contributes to the same lines of inquiry and, we hope, introduces them into later proto-historic studies as a viable area for further investigation.

Damp, Nicholas (University of Colorado at Boulder) and Catherine Cameron (University of Colorado at Boulder)

[218] *Negotiating Identity on the Frontiers of the Chacoan World*

The Chacoan World was composed of a diverse array of cultural areas and identities. These patterns were more tangled along the frontier, places of interaction and contestation where social identities could be part of the active negotiation of power and place. Two areas serve to demonstrate that Chaco was often an overlay on local, variably diverse cultural patterns. Bluff, a Chacoan great house on the northwest margin of Chaco's World is within the Mesa Verde region, but near boundaries with both Kayenta and Fremont culture areas. Bluff residents were, therefore, exposed to a range of social identities, including Chacoan. In the Zuni region, new research at outlying great house communities, such as Village of the Great Kivas, suggest that these communities were part of a contested landscape—only small pieces of a larger Chacoan movement that was embedded within local histories and traditions. The Chacoan period, however, appeared to have been minimal and brief, leaving few lasting effects in the region. We argue that the initial diversity and strength of social patterns in the Zuni region and SE Utah affected the nature of their participation in the Chaco regional system and hence the strength of the adoption of a Chacoan "identity."

Dan, Cabanes [172] see Albert, Rosa

D'Andrea, A. Catherine [250] see Nixon-Darcus, Laurie

Daneels, Annick [264] see Liberotti, Giovanna

D'Angelo, Jasmine [240] see Klessig, Barbara

Daniel, Alessandra [284] see Homsey, Lara

Daniels, James (ASM Affiliates) and Jerry Schaefer (ASM Affiliates)

[77] *The Application of Ceramic Petrography and XRF Sourcing to the Interpretation of Prehistoric Aboriginal Pottery and Clay Sources in the Southern Mojave Desert*

Conventional ceramic typology of buff and brown ware ceramics in the California desert region has been less than satisfying in answering meaningful questions about the prehistoric hunters and gatherers who made and used these vessels over the last 1,000 years. This study uses petrographic and chemical analysis with a portable X-ray fluorescence spectrometer to characterize ceramics and clay sources to determine whether ceramics recovered from sites on Marine Corps Air Ground Combat Center (MCAGCC) represent a local tradition or were ceramics imported through travel or exchange.

Dao, Peter [83] see Boyce, Joe

Dario, Guiducci [215] see Burke, Ariane

Darley, Zaida [205] see Davis-Salazar, Karla

Darling, J. Andrew [279] see Glascock, Michael

Darnell, John (Yale University, Department of NELC)

[164] *The Protection and Sharing of Sites in the Egyptian Western Desert*

Protection of sites in Egypt is often a difficult matter, given the limited resources of the antiquities authority, and accounts of buried treasure that not infrequently have some reality behind them. Modern tourists and resident expatriates often contribute to the problem by conducting illegal "expeditions" in uninformed mimicry of actual works of recording and excavation. Protecting desert sites is a particular problem, due to the remoteness of the locations and the lack of water and provisions. Some successful approaches in the Egyptian Western Desert have included attempts to educate "adventure tour" companies and guides, and attaching local antiquities inspectors to at least some of those groups. The establishment of guards, where possible, salaried by the archaeological/epigraphic mission has, of course, proved most effective. The ultimate preservation of many of these desert sites, particular those with rock inscriptions, may unfortunately lie in the realm of recording. Proper excavation and recording, in conjunction with modern photographic and scanning techniques, allow for a virtual recreation of desert sites, thereby allowing for the dissemination of the greatest amount of information to the scholarly and "lay" communities, and even permitting something approaching a re-excavation or recording of the site by future archaeologists and epigraphers.

DaRos, Maureen and Rebekah DeAngelo (Peabody Museum of Natural History)

[182] *Archaeology in the Archives: Rediscovery of a 1932 Connecticut Archaeological Site Map*

Museum archives can be an important part of archaeological research, but archival material is usually stored separately from collections, and these resources are often underutilized. The Peabody Museum of Natural History at Yale University was awarded a grant from the Hidden Collections program of the Council for Library and Information Resources to systematically catalog the archives in every collection division and to disseminate the holdings in a variety of finding aids and on-line catalogs for the use of students and scholars. When the Peabody Anthropology Division began cataloging its map collection they came upon the 1932 Connecticut archaeological survey site map done by Froelich Rainey. Many knew this map existed, but did not know where it was curated. The map records the efforts of Yale's archaeological survey of Connecticut which began in the early 1900's. These early archaeological surveys and excavations resulted in the discovery of habitation and hunting sites containing ceramic, lithic and faunal material. Using the resources and technology of the Yale Digital Collections Center, the map will be conserved, scanned, and stored properly for future use.

Darrin, Margaret (Ann) (Johns Hopkins University Applied Physics Laboratory)

[13] *Space Environmental Effects on Material Remains*

This paper presents an overview of the impact of the space environment on human-kind produced materials and gives examples of objects current in space. Engineered structures existing in space for any period of time will be subject to environmental conditions very different from those on earth. The effects of vacuum and radiation, for example, on various materials used for spacecraft design depend on the material properties such

as density, atomic number, conductivity, etc., and length of exposure, and may impact performance. Earth's atmosphere shields us from radiation. The radiation exposure encountered by structures in space causes damage by a variety of mechanisms including charging, electronics degradation, and radiation-induced sublimation. Plasma, ionizing radiation, micrometeor/orbital debris, neutral gases, and the solar and thermal environments in space have their own effects on materials and structures.

The relevant environmental factors introduced will be plasma, ionizing radiation, micrometeor/orbital debris, neutral particles, solar environment, and thermal environment along with the effects of contamination, and aging. This presentation follows the basic scientific questions related to material remains such as what does one expect to find and its corollary response, what did we find?

Darwent, Christyann [20] see Brown, Sarah

Darwent, Christyann (University of California, Davis)

[71] *Using Ancient DNA to Understand the Role of Baleen Whales in the Development of Archaeological Cultures in Outer Kotzebue Sound, Alaska*

Whale bone samples were collected in 2010-11 across the beach ridges of Cape Krusenstern and Cape Espenberg, which bracket the north and south end of Kotzebue Sound, Alaska. At Cape Krusenstern one whale bone sample was collected from a locality dated to 2800 B.C. (Old Whaling), but the remaining 11 samples come from Birnirk (ca. A.D. 600-800) and Thule contexts (ca. A.D. 800-1700). At Cape Espenberg a total of 29 samples were collected from across the early-late Thule and historic Iñupiaq beach ridges, of which 16 were recovered from excavated contexts. Each sample was directly radiocarbon dated to assess their relative age compared to their position on the beach ridges (horizontal stratigraphy), and as an indicator of feeding environment isotopic analysis of 13C, 15N (Joan Coltrain, University of Utah), and 18O was undertaken on the samples. Ethnographically bowhead whale was the most commonly hunted baleen whale species in North Alaska; however, the majority of specimens were identified by aDNA as gray whale (53%). Bowhead (27%) and humpback (20%) comprise the other two identified species, the latter of which is not typically found north of the Seward Peninsula today.

[71] *Chair*

Darwent, John (University of California, Davis), Owen Mason (University of Colorado-Boulder), John Hoffecker (University of Colorado-Boulder) and Christyann Darwent (University of California, Davis)

[206] *Thule-Inupiaq Occupation of Cape Espenberg, Alaska: A Case of Horizontal Stratigraphy*

Cape Espenberg is on the farthest southwestern extent of Kotzebue Sound, Alaska, just above the Arctic Circle, and is a peninsula composed of a series of dune-covered beach ridges. As part of a larger research initiative, extensive mapping to record all cultural features and characterize the topography of approximately 1 km² on the southeastern terminus of the cape was undertaken in 2007 and 2010. The primary purpose of this mapping was to explore the use of the cape for the past 1200 years using one of the unique aspects of beach-ridge archaeology: horizontal stratigraphy. There were 11 intervals of beach ridge/dune development, and with the exception of one truncated ridge and the modern ridge, Thule-Inupiaq people built semi-subterranean winter houses on each ridge. A total of 117 house depressions along with related cache pits, artifact scatters, whale bone, and hearths were identified; distribution of house forms indicate that Cape Espenberg has had an unbroken stream of cultural continuity. However, in terms of house architecture and community patterning, it appears that has been a reduction of certain

architectural components over time. Houses also occur more frequently in isolated contexts. Both aspects are coincident with the onset of the Little Ice Age.

David, Francine [96] see Blackwell, Bonnie A.B.

Davies, Ben [23] see Romanowska, Iza

Davies, Benjamin (The University of Auckland)

[184] *Modeling the Formation of Surface Archaeological Deposits in Western New South Wales, Australia*

Using elements of GIS, agent-based models, and spatial simulation, this study demonstrates the effective combination of geomorphological and archaeological research within a modeling framework. Recent geoarchaeological research in arid Australia suggests that the visibility of surface deposits, which are ubiquitous in the region, is primarily determined by an irregular erosion process dependent on fluctuations in aridity. Furthermore, lithic assemblages are depleted in cortex, a pattern attributed to the curation of informal stone flakes. In order to assess how different patterns of erosion produce patterns of feature visibility, and how mobility influences the composition of lithic assemblages, a series of computational models are constructed in order to experiment within a surrogate system. First, several abstract concept models, both geomorphic and behavioral, are used to explore the dynamics of the proposed processes and evaluate null hypotheses. These models are then joined in a more realistic spatial simulation, and results are compared to known archaeological data from the region. By applying a model-based framework, the implications of assumptions upon which archaeological hypotheses are built can be more fully understood, helping to refine core ideas, produce new questions, and provide direction for further analysis.

Davila Cabrera, Patricio (INAH)

[160] *Reflexiones sobre la cuestión arqueológica de la región huasteca*

Se ha considerado a la región huasteca como una de las áreas culturales que conformaron Mesoamérica. En los términos estrictos del concepto de Mesoamérica, es cierto para los últimos siglos precortesianos. Pero en cuanto a que haya estado integrada con el México antiguo, en las etapas anteriores al llamado posclásico, los datos arqueológicos nos plantean otro aspecto.

Examinaré algunos de los mitos y realidades que han caracterizado a la arqueología huasteca, entre ellos; su relación con el mundo maya y con el imperio mexica, para ello expondré los ejemplos principales.

Davis, Sara (Archaeological Investigations Northwest, Inc.)

[128] *Prehistoric Habitation Features in South-Central Oregon*

The Langell and Willow Valleys of South-Central Oregon are rich in prehistoric archaeological sites that demonstrate the intensive past use of this landscape. Prehistoric habitation or residential features have been recently documented and studied in this area of South-Central Oregon. Four excavated features from different archaeological sites are examined regarding their artifact content, placement on the landscape, and layout. These habitation or residential features are compared to ethnographic accounts of Klamath and Modoc structures as well as previously excavated habitation features in this region to demonstrate the differences in location, setting, use, and form. Recognizing both the clear and subtle attributes of habitation features will be key for future archaeologists working in this region.

Davis-Salazar, Karla (University of South Florida) and Zaida Darley (University of South Florida)

[205]

A Long-term Perspective on Water Management at Palmarejo, Honduras

Ethnographic research has long been used to understand archaeological contexts. It has also been argued that the long-term perspective of archaeology is a unique advantage of the discipline for understanding contemporary human-environmental relationships. This poster presents the social, political, economic, and ecological contexts of water management in the Palmarejo Valley of Honduras, comparing ancient patterns and practices with the contemporary situation in order to reconstruct the socioecological history of the valley. Archaeological investigations, geoarchaeological research, spatial analysis using geographic information systems, and soil science were employed to investigate Late Classic (ca. AD 600-900) water management. Ethnographic research, including interviews, mapping of cultural and ecological features, and water quality tests, were used to assess the current water situation. Interestingly, our archaeological and ethnographic research suggests similar patterns of water use and control, namely a focus on community-based management. Elsewhere, Darley argued that community-based water management allowed Late Classic elites to control local populations, while Davis-Salazar has argued that a community model of water management has contributed to water quantity and quality problems in the valley today. The implications of community-based water management for ancient and contemporary sociopolitical dynamics in the Palmarejo Valley therefore warrant further investigation and are explored in depth.

Dawkins, Brian (Cal State Northridge)

[130] *From the Desert to the Ocean: A Study of Cactus Spine Fishhooks on the Greater California Bight*

Prehistoric fishing models are based on the fishing artifacts most often recovered; the ones produced from shell, bone and other durable materials. However by expanding beyond the material culture and looking at ethnography the complete fishing model expands, including new tools, beyond what can be documented archaeologically. In the case of Baja and Southern California an interesting technology appears; the cactus spine fishhook. By exploring ethnographic, archaeological and preliminary experimental data, a picture of the production, use, and impact that the cactus spine fishhook has had on regions of California and beyond begins to emerge

Dawson, Peter (University of Calgary), Margaret Bertulli (Parks Canada), Lyle Dick (Canadian Historical Association) and Lynn Cousins (Parks Canada)

[221] *Heritage Overlooked and under Threat: Fort Conger and the Heroic Age of Polar Exploration*

Fort Conger is located in Quttinirpaaq National Park, on Northern Ellesmere Island in the Canadian Arctic. The site is of national and international significance because of the intrinsic role it played in several High Arctic expeditions between 1875 and 1935, particularly during the height of the race to the North Pole around 1900-1910. The site's historic connections, heritage resources, and enduring sense of place are the reasons for its many designations and honors. In this paper, we examine how Fort Conger's links with Greenlandic Inughuit heritage have been overlooked, as well as discuss various threats to Fort Conger's enduring legacy as a heritage site of national and international significance.

Dawson, Peter [224] see Butler, Don

Day, Peter [258] see Hommel, Peter

Day, Peter (University of Sheffield)

[288] *Reconstructing Practice in Kampos Group Ceramics: Technological and Cultural Diversity in the Early Third Millennium B.C.*

The end of the Early Bronze I period in the Aegean is a time of diversity in material culture, an apparent mobility of styles, objects and perhaps people. Perhaps the most celebrated example of this has been the 'Kampos Group' which, though culturally characteristic of the Cycladic Islands, appears in specific locations on the North Coast of Crete for a brief period, contrasting with material we might characterize as being local 'Minoan'.

In a phenomenon suggesting colonization, ceramic, lithic and metal objects have joined characteristic graves as evidence for the possible movement of population. These are concentrated in a number of sites, mainly but not exclusively funerary, sometimes alongside 'Minoan' elements of the ceramic repertoire.

At a time when the role of the craftsman, and especially those involved in emergent metallurgical technologies, is considered important, the location of production of Kampos Group pottery is of real significance, whilst its technology of manufacture may provide clues as to specific craft practice and its transmission. The use of both calcite and grog tempering in these stylistically distinctive vessels challenges our ascription of simple cultural labels and encourages us to consider the complexity of style in object form, decoration and technological practice.

[288] *Chair*

de Anda, Guillermo [109] see Amador, Fabio

De Anda Alaniz, Guillermo (Universidad Autonoma De Yucatan)

[113] *Climatic Changes during the Terminal Classic Period at Chichén Itzá, Yucatán*
In this work we present data related with the possible change in levels of the aquifer in the Yucatan Peninsula, particularly those that took place during the X and XI centuries. According to paleoclimatologists, severe changes in the patterns of rain occurred during those two centuries and changed dramatically, which caused long drought periods during the VIII, IX and X centuries. Recent underwater archaeology investigations that took place in cenotes at Chichén Itzá, seem to validate these scenarios. In this presentation, we evaluate archaeological evidence that seem to point to the fact that radical changes in the water levels occurred sometime toward the end of the Terminal Classic and at the beginning of the Postclassic periods.

De Angelis, Hernán [26] see Nuevo Delaunay, Amalia

De Brer, Christian [253] see Fischer, Christian

De Guzman, Margarita

[99] *Creating a Community of Archaeology: The Story of the SVG Public Archaeology Program*
Thanks to the hard work and due diligence of the National Trust and the International Airport Development Company of St. Vincent and the Grenadines (SVG), mitigative excavations were undertaken in 2009 and 2010 on the island of St. Vincent, in advance of extensive earthwork construction for development of the international airport. This work proved to be highly significant, but had reached its financial capacity. A larger site, Argyle 2, was under threat of destruction. The SVG Public Archaeology Program was thereby created to fund investigations at Argyle 2, as well as to raise money for the SVG National Trust. This was been a challenging process, with no sponsorship, no external funding, and a small timeframe for promotions and volunteer recruitment. However, over its two seasons, The SVG Public Archaeology Program (also known as SVG Digs), recruited 17 volunteers from Canada, the United States and Greece, as well as countless local volunteers, identifying over 150 features and 33 burials, recovering numerous artifacts. The findings were highly significant in terms of

age and rarity, as well as being the first reported deviant burials dating to the Saladoid period in St. Vincent, and perhaps in the Caribbean as a whole.

de Leeuw, Roosje [135] see Groen, Mike

De Leon, Alexandra [84] see Junker, Laura

De Leon, Jason (University of Michigan)

[121] *Necroviolence and the Posthumous Lives of Undocumented Border Crossers*

In the 1990's the United States adopted a border enforcement strategy that funneled unauthorized migrants towards remote areas such as the southern desert of Arizona in an attempt to use the terrain as a form of deterrence. This strategy has failed to significantly deter migration but it has increasingly made border crossings more dangerous and deadly. Since 2000, approximately 200 bodies of undocumented migrants have been recovered on both sides of the border annually. Many more people remain unrecovered because there is no systematic attempt to locate the remains of crossers, corpses are located in remote areas, or the bodies have been destroyed by animals or environmental conditions. While much research has focused on the violent social process of border crossings, little work has focused on the post-mortem lives of migrant bodies. Using a combination of ethnographic, archaeological, forensic, and experimental taphonomic data, we argue that what happens to the bodies of migrants in the desert is not a simple matter of decomposition, but rather represents a complex nexus of border enforcement policies and practices coupled with biological and environmental processes that wreak havoc on corpses and create a post-mortem form of trauma that we term necroviolence.

[121] *Chair*

De León, Jason [121] see Drummond, Justine

de los Rios Farfan, Gabriela [239] see Sharratt, Nicola

de Moor, Victor [76] see Nightingale, Sheila

De Smet, Timothy, Mark Everett (Texas A&M University), Tanya Komas (California State University, Chico) and Robert Warden (Texas A&M University)

[92] *3D GPR on Alcatraz Island, San Francisco Bay, California*

Modern Alcatraz Island in San Francisco Bay, California, is known mainly for its prison, and the extant structural remains are a testament to this period of the island's history. The island, however, was a military fortification before it was a military then federal prison. Ground penetrating radar (GPR) has proven to be an important tool for historical archaeology. In June 2012 a 3D GPR survey was conducted in the modern prison recreation yard. During the 1860s and 1870s three east-west running fortification bombproof tunnels (I, J, and K) and a number of batteries were constructed on the summit of the island in the area of the modern recreation yard. The intent of the GPR survey was to determine whether these (now subsurface) structures survived subsequent modification as the island was converted from a fort to a prison. We are currently processing the data from this important historic landmark.

De Vore, Steven [34] see Dalan, Rinita

De Vore, Steven

- [184] Magnetic Survey of the Mound City Group, Hopewell Culture National Historical Park, Ohio**
 During the past four years, the Midwest Archeological Center has conducted a magnetic survey of the Mound City Group at Hopewell Culture National Historical Park in Chillicothe, Ohio. The Mound City Group represents a Hopewell mound and earthen enclosure site on the left bank of the Scioto River in Ross County, Ohio. The site extends over 13 acres and contains a square enclosure wall, mounds, and borrow pits, which were first documented by Ephraim G. Squier and Edwin H. Davis in the mid-1800s. The construction of the World War I training facility of Camp Sherman resulted in the leveling of the site. The earthworks were reconstructed when the Mound City National Monument was established in 1923. The addition of the Hopeton Earthworks, Hopewell Mound Group, Seip Earthworks, and High Banks Works resulted in the establishment of the Hopewell National Historical Park in 1992. The magnetic survey of the Mound City Group represents a continuation of the National Park Service's investigations into the cultural and physical modifications of the Hopewell landscape. The magnetic data revealed intact, buried archeological resources associated with the Hopewell site, as well as the Camp Sherman modifications and subsequent reconstruction activities at the site.

de Vos, John [68] see Bosch, Marjolein

- Deal, Michael (Memorial University of Newfoundland)**
[54] The Boswell Site and Precontact Archaeology on the Annapolis River, Nova Scotia
 The Annapolis River is one of the major waterways of southwestern Nova Scotia. The first permanent European settlement in Canada was established at the mouth of this river, and much of our understanding of the Contact period Mi'kmaq comes from early French accounts from this area. However, the Annapolis River has received very little attention from archaeologists. A review of past research and recent archaeological and paleoethnobotanical work at the deeply stratified Boswell site is used to assess the potential for future work on the river. Work thus far has uncovered evidence of Middle and Late Woodland deposits, including pottery, lithics and charcoal, as well as faunal and flora remains. Furthermore, Transitional Archaic artifacts surface collected at the river's edge indicate that this site may produce the first in situ evidence of Transitional Archaic occupation in the province.

Dean, Curtis (Stantec)

- [266] Ecofact or Fiction?**
 Recent excavations at the famed Glenrose Cannery site in Delta, British Columbia, have unearthed a number of controversial bead-like artifacts. Are they artifacts, definitively artificial items of decoration and personal adornment, or simply ecofacts, naturally occurring and not modified by humans? We examine the beads to determine their origins, raw material type, and possible manufacturing techniques. We also review these items within the context of local bead typologies, and determine how they fit in regionally. Natural formation processes are examined and applied to our data. These investigations are synthesized into a final summary that reveals the story of these mysterious artifacts.

DeAngelo, Rebekah [182] see DaRos, Maureen

- Deaver, William (WestLand Resources, Inc.) and Mark Chenault (Jacobs Engineering Group, Inc.)**
[16] A Reconsideration of the Hohokam Polvorón Phase
 Archaeologists working in the Hohokam heartland during the 1980s posited a Polvorón phase (A.D. 1350–1450) at the end of the Classic period. This required a reconsideration of the previously defined Civano phase (A.D. 1300–1450). As proposed,

Polvorón commenced with the collapse of the Hohokam platform mound system in the Phoenix Basin. The phase is defined by significant changes in architecture, social organization, and regional interaction. The proposition sparked a brief debate that was not resolved. The debate focused on the perceived chronological overlap of contexts attributed to the Polvorón phase with those attributed to the Civano phase. We revisit this debate from a perspective independent of the phases. We rely on a large database of archaeomagnetic dating samples to establish a timeline for the Classic period. We use a subset of these data from Mound 8 at Las Colinas to posit the period of platform mound construction and abandonment. We then investigate characteristics of the archaeological contexts before and after the Mound 8 abandonment. The findings indicate a long period, perhaps a century or more, of continued occupation after the Mound 8 abandonment.

Deaver, William [130] see Prasciunas, Mary

DeBarros, Juanita [42] see Mant, Madeleine

- Debono Spiteri, Cynthianne (Max Planck Institute for Evolutionary Anthropology), Amanda Henry (Max Planck Institute for Evolutionary Anthropology) and Oliver Craig (Department of Archaeology, BioArCh, University of)**
[253] Lipid Analysis and Plant Residue Identification: New Perspectives

Archaeobotany has contributed considerably to our understanding of crop plant evolution and paleodiet, through archaeological and multidisciplinary high resolution scientific analysis, including organic residue analysis (ORA). ORA is a routinely applied technique that targets lipid residues trapped within the walls of unglazed ceramics vessels, thus allowing a direct determination of the content and function of archaeological ceramics. One of the key questions that has been addressed using ORA is tracing changes in resource exploitation through time. Plant material has however, largely been ignored as a significant commodity processed in prehistoric pots, because they are rarely identified using ORA, despite their perceived dietary importance. The apparent absence of plant residues may be related to our analytical techniques which favor lipid rich animal products, but could equally be due to how they were processed, which might have left little residue in the first place. This paper will review published literature on the identification of plant oils using ORA, present new data on the processing of plant material, and consider new perspectives for lipid analysis directed towards expanding the range of analytical techniques used and the archaeological material targeted.

Debout, Grégory [227] see Peschaux, Caroline

DeCorse, Christopher [261] see DeCorse, Christopher

DeCorse, Christopher (Syracuse University)

- [261] Bunce Island, Sierra Leone: Merchant Outpost of the Atlantic Slave Trade**
 Bunce Island in coastal Sierra Leone is a unique cultural monument to Africa's intersection with the United States and the wider Atlantic World. One of more than sixty forts European slave traders built on the West African coast, the island was a center of British trade from about 1670 to 1808. Initially established by the Gambia Adventurers and the Royal African Company, the island reached its apogee during the eighteenth century under the private trading companies of Grant, Oswald & Company and the Company of John & Alexander Anderson. During its 140 years of operation, the traders on Bunce Island exiled thousands of enslaved Africans to the West Indies and North America, particularly South Carolina and Georgia. Approximately the size of a couple of city blocks, the Island was home to both a fort complex

and a village of grumetes; paid African laborers. The grumetes were crucial to the islands economy, emerging as a distinct population but also a workforce intricately linked to the islands operation. This paper examines the complex and nuances social hierarchies and the insights provided by the archaeological and documentary record.

[261] *Chair*

Deeb, Rebecca [140] see Kestle, Caleb

Deeley, Kathryn [241] see Woehlke, Stefan

DeFrance, Susan [148] see Fortin, Louis

Dega, Michael (Naga Research Group) and Kaseka Phon (Royal Academy of Cambodia)

[249] *The Ceramic Production Center of Cheung Ek, Phnom Penh, Kingdom of Cambodia*

The village of Cheung Ek, located just outside the capital city of Phnom Penh, is most infamously known as one of the famed "Killing Fields" of Cambodia's 1970s Khmer Rouge Regime. Recent archaeological work in Cheung Ek by Khmer archaeologists have shown that occupancy of the Cheung Ek area is vastly deeper in time, and the significance of the early historic site underlying the Killing Fields appears to hold the key to better understanding early polities of the floodplain in Cambodia. The main features of the Cheung Ek site are kilns, with over 70 having been documented at this location over the past several years. Kiln technology and chronology in Cheung Ek is much better understood given data from the excavation of numerous kiln features in 2012. This paper will discuss Cheung Ek kiln construction and morphology, from its earliest construction stage through finished product. Technological analysis provides evidence as to how the kilns were built and utilized to produce industrial-sized amounts of ceramics through time.

Degraffenreid, Jennifer [128] see Jolie, Ruth

DeHaven, Lydia

[184] *Expanding Basketmaker III Site Boundaries: Geophysics Use in Detecting Structures and Features*

The Crow Canyon Archaeological Center's (CCAC) Basketmaker Communities Project (BCP) focuses on establishing a detailed depiction of early pueblo groups in the Mesa Verde region. Current research on the Dillard site, a Basketmaker III settlement, has been underway since 2011. In conjunction with Time Team America (a NSF funded television program through Oregon Public Broadcasting), extensive geophysical survey was conducted at the site in 2012. The use of magnetometry, magnetic susceptibility, and electric resistivity revealed important information on the nature of the buried features within the sites boundary. These efficient survey methods allowed for a large area of the site to be surveyed over a limited two-day period. Anomalies detected were augured or excavated to ensure the reliability of the geophysical data. Multiple pitstructures and features were detected as a result of the use of these techniques. These previously unknown features highlight the usefulness of geophysics in expanding our knowledge of Basketmaker III communities with limited excavation. Geophysical survey is part of an evolving methodology, which allows for a more holistic landscape approach to archaeological sites as well as the use of a targeted excavation approach.

Deibel, Michael (Earlham College), Emily Stovel (Ripon College) and William Whitehead (University of Wisconsin-

Fond du Lac)

[253]

Changes in Mortuary Ceramics and Ritual between the Middle and Late Intermediate Periods (A.D. 500-1450): Using pXRF in Northern Chile

pXRF data is providing a wealth of information on ceramic provenance, movement and exchange, despite reservations about its reliability. Here, however, we present exploratory pXRF data on locally produced ceramics from northern Chile as part of a larger study concerning changing ceramic mortuary production and consumption in the transition between the Middle Period (A.D. 500-1000) and the Late Intermediate Period (A.D. 1000-1450). We know that at this point, with the decline of Tiwanaku influence in the region, ceramics loose importance as burial goods, graves are characterized by more domestic, rather than ritual, objects, and ceramic style changes significantly; delicate polished blackwares are replaced with thick-walled burnished bowls and jars. As part of an initial foray into social and political changes in mortuary behavior, this talk will provide the results of a chemical characterization of ceramics from both periods. Our goals has been to identify and understand, if any, concomitant changes in local ceramic production beyond shape and surface treatment as part of larger social changes.

Del Alcázar Orosco, Melisa [286] see Klaus, Haagen

Del Castillo, Luis Felipe [234] see Lailson Tinoco, Becket

Del Cid, David [21] see Rivera Castillo, Patricia

Del Cid Castillo, Lic. David Ricardo [21] see Alcover Firpi, Omar

Delacorte, Michael, Mark Basgall (California State University, Sacramento) and Lynn Johnson (Eastern California Museum)

[12] *Sociopolitical Dynamics in the Late Prehistoric Southwestern Great Basin*

Recently acquired toolstone sourcing and other high-resolution archaeological house feature data indicate that late prehistoric sociopolitical boundaries in eastern California were more porous than previously envisioned. Evidence suggests that household groups seasonally traveled on a regular basis between widely separated regions and language areas, as subsistence required and kinship allowed. This is in keeping with all but the most complex forager systems, and raises significant questions about the territorial nature of eastern California hunter-gatherers.

DeLeonardis, Lisa [19] see Werness-Rude, Maline

DeLeonardis, Lisa (Johns Hopkins University)

[59] *Encoded Color, Encoded Value in Paracas Post-Fired Painted Ceramics*

Ceramics were a central artistic medium for the Paracas of south coastal Peru (ca. 900 B.C.–A.D. 1), one in which esoteric and shared knowledge were visually expressed. Among a constellation of design techniques, post-fired paint applied to incised pottery resulted in a vibrant color palette otherwise impossible to achieve through conventional methods. To date, analytical approaches to ceramic paint color have been few, yet color encodes fundamental aspects of the structure of societal beliefs and social identity. Moreover, its investigation bears upon related questions of resource procurement, technology, artist's skills and social organization, and the protocol of regional authorities in design and production processes. In this paper, I examine the production process as well as the raw material and technology relevant to paint color and discuss broad temporal and regional trends in the distribution of resources and objects. These analyses suggest that

the creation and application of paint color required resources and knowledge distinct from other steps in the production process and advance our understanding of the social organization of artists and the role of agency in ceramic design and production.

Delgado Espinoza, Florencio

- [1] *Spatial Analysis of the Manteño Occupation at the Cerro Jaboncillo-Hojas Site*

The results of a systematic survey of the Cerro Jaboncillo-Hojas archaeological area in coastal Ecuador were analyzed using GIS tools. They show the presence of a variety of architectural features such as stone foundations of buildings, called "corrales," water holes and storage structures. In addition, there is evidence of ancient trails, water canals, and agricultural terracing. Through the aid of GIS we have reconstructed the spatial organization of the site which allows us to understand the local social processes that took place during the late-period Manteño occupation.

- [1] Chair

Dell'Unto, Nicolo [9] see Issavi, Justine

DeLuca, Dan W. [260] see Griego, Anthony

DeMaio, Justin (Desert Research Institute/UNLV)

- [122] *Before Nuclear Testing: Evidence of Prehistoric Inhabitants on the Nevada National Security Site (NNSS)*

The Nevada National Security Site is most well-known for the nuclear tests performed there in the latter half of the 20th century; however, human occupation of this land extends back approximately 12,000 years. The remains of the prehistoric people found on the NNSS are representative of a hunting and gathering lifestyle that adapted to a changing climate throughout the Holocene period. This dynamic landscape required a strategic knowledge of resource locations and environmental obstacles to sustain a viable community over time. Temporary camps, processing stations, rock cairns, stone quarries, and other miscellaneous artifact scatters have been recorded by DRI archaeologists over the past 40 years. These findings have led to models of differential landscape use across time and space and understanding the introduction of new technologies in the region such as the bow and arrow and brownware pottery. Also, petroglyphs in Fortymile Canyon give insight to ideological aspects of prehistoric culture on the NNSS. Overall, this expansive archaeological record shows a long history of human occupation in a rather desolate region and provides valuable information on a past lifestyle that is usually difficult to trace.

Dematte, Paola (RISD) and Jeremiah Watson

- [240] *Xumishan, Ningxia, China: The Archaeology of Buddhist Grottoes*

The Xumishan site, an ensemble of over 130 Buddhist and Taoist grottoes as well as prehistoric religious installations spreads over eight hills in a two kilometer area in China's northwestern Ningxia province. The majority of the Xumishan grottoes were carved over a six-hundred year period starting from the 4th and ending in the 10th century to serve as locales for worship and pilgrimage. Following this period of intense activity, the site was subjected to limited construction which was mostly focused on the upkeep or transformation of existing grottoes and temples. The site provides a unique record of thousands of years of religious life on a little known section of west China. This collaborative project used GIS tools to analyze the landscape providing new material for the understanding of the religious landscape of ancient monastic and trading communities on the Chinese Silk Road, highlighting peculiar artistic and religious practices, cultural idiosyncrasies and complex social contexts.

Demetradze, Irina

- [226] *Roman Settlement Patterns in Eastern Caucasus*

Favorable socio-political, economic, and environmental conditions stimulated settlement formation in the Kura-Aragvi basin in historical province of Iberia during the Roman period. Later changes in these conditions altered settlement patterns in the first-third centuries AD. Archaeological and written records and environmental evidence reveal these changes. Archaeological finds indicate gradual displacement of the population from hillsides to lowlands. The floodplains and riverbanks that were used solely for funerary purposes in the fourth-third centuries BC were used as human occupational sites during the first-third centuries AD.

Several settlements located in the area are mentioned in the writings of the first-third centuries Greco-Roman authors. Nevertheless the names and the function of the settlements are different. Presumably, they varied in accordance with social change.

Environment of the area evidenced changes since antiquity. The Kura and Aragvi floodplains went through the process of deforestation, which resulted in riverbank modification and alluvial land formation. This alteration also caused infrastructural changes, which are reflected in the management of the floodplains. One of the alluvial terraces was used for agricultural activities. Another that was lower previously and prone to flooding was settled. Changes in settlement patterns therefore cannot be attributed solely to Roman influence.

Demirergi, Arzu [32] see Tung, Burcu

Dennehy, Timothy, Benjamin Stanley (Arizona State University) and Michael Smith (Arizona State University)

- [273] *Measuring Inequality in Premodern Cities: Spatial and Built-Environment Measures*

How did people in ancient societies experience urban life? In this paper we use spatial analytical methods to illuminate one aspect of the urban experience: equity of access to facilities that provide material, religious, and governmental services. We use secondary sources, digitized maps, and GIS analysis to compare two archaeological cities (Teotihuacan and Tikal) and three historical cities (Bhaktapur, Chester, and Lamu). By examining the distances urban dwellers from different neighborhoods traveled to access facilities, we are able to address important questions about premodern urban living in a fashion similar to modern equity studies. Do longer distances traveled by some residents indicate lowered access to services? Is travel distance correlated with markers of wealth such as house size or quality of household goods? We argue that greater travel time to important services negatively impacts the well-being of urban residents in two ways: it reduces access to key services, and takes time away from other essential activities. These negative impacts are not equitably shared by rich and poor alike, and our study opens a new window on the nature of social inequality in the premodern urban experience.

Dennis, Robyn (University of Arkansas Center for Advanced Spatial Technologies)

- [121] *Security and Shelter in the Desert: Visibility and Its Role in the Location of Migrant Stations*

Since the mid 1990's, the border enforcement strategy known as Prevention through Deterrence (PTD) has resulted in greater numbers of undocumented migrants attempting to cross the southern border of the United States in harsher and more remote regions. Since 2009, the Undocumented Migration Project has been recording the location and material culture of temporary resting places, or migrant stations, in the Sonoran Desert to better understand how people engage with this harsh environment. The geography of the region, particularly topography and vegetation, plays a critical role in the selection of locations to rest or eat, since security and shelter from the elements are a primary concern. Vegetation type and density affect comfort through the quality of

shade available and provide some cover from Border Patrol surveillance, while topography can provide both shelter and cover in rugged terrain but will also make traversing the landscape more difficult. This research integrates 3D vegetation models into viewshed analysis of the landforms to analyze the visibility of documented migrant stations from surrounding areas in an attempt to better understand how migrants both navigate and experience this terrain.

Dennison, Meagan (University of Tennessee, Knoxville)

- [173] *Exploring Site Function through Faunal Remains on the Upper Cumberland Plateau of Tennessee*

Determining settlement patterns is a fundamental aspect of prehistory that archaeologists often wish to address. This can be done by examining artifact assemblages and site features that can be used concomitantly to address seasonal rounds, site function and activities that occurred on site. This paper explores the recent results of such an undertaking at several archaeological sites on the Cumberland Plateau of Tennessee. The Archaic and Woodland hunter-gatherers who inhabited this area utilized natural features on the landscape, such as caves and rock shelters, as both residential base camps and hunting camp sites. This is reflected in the archaeological assemblages of these sites. The main focus here is on subsistence data, especially the distribution of large mammal remains from site to site; however, other artifact assemblages cannot be ignored, including lithic tool and debitage data, paleoethnobotanical remains and varying site features. The results of this research indicate that, when sample sizes are large enough, faunal assemblages do reflect site function, and are therefore an important element in interpreting settlement patterns.

DePratter, Chester [24] see Cobb, Charles

DePriest, Paula (Smithsonian Institution)

- [31] *Discussant*

Der, Lindsay (Stanford University)

- [9] *Human-Animal Relations and Social Organization at Çatalhöyük, Turkey*

How may have changing human-animal relationships shaped social organization at the Neolithic site of Çatalhöyük, Turkey? Using a Geographic Information Systems (GIS) analysis, this pilot study will synthesize both quantitative and qualitative datasets from specialist labs in order to examine patterns using the house as the base unit. While there is no evidence for distinct stratification, there is likely horizontal social difference given the variation in house elaboration and ritual, much of which centers on animal themes and associations. Thus, this poster looks at material from three different depositional contexts (floors, middens and fills), building upon datasets inclusive of faunal remains, iconography, architectural installations and figurines. Through the identification of spatial associations and the autocorrelation of specific types of animal representations and objects with specific houses, it is possible to investigate the presence or absence of intra-community social groups.

Derr, Kelly (Washington State University)

- [170] *Shifting Landscapes: Emergent Hunter-Gatherer Social Complexity and Landscape Management in the Gulf of Georgia*

Precontact peoples of the Salish Sea inhabited and exploited environments of resource abundance. Ken Ames has argued that intensified production of faunal and floral resources, rather than a single resource such as salmon, was critical to the development of social complexity. While salmon played a critical role in establishing such complexity, it is difficult to identify intensification

in the archaeological record using faunal data alone. I argue that in order to fully understand early inequality we must consider the intensification of terrestrial and particularly floral resources, and incorporate both archaeological and ecological data into our research. Intensification of production involves new methods of land tenure and resource ownership requires a shift in both the physicality of resources and in social landscapes. Establishment and enforcement of new social rules governing resource management is required, and this is particularly true for the use of anthropogenic fire. This paper presents data relating to the emergence of such practices and explores the role of anthropogenic fire as a mechanism of social change at the Shingle Point village site on Valdes Island, southwestern British Columbia. These data provide fuel for a new model for investigating the emergence of social complexity in the Salish Sea.

Des Lauriers, Matthew (California State University, Northridge)

- [177] *"They had among them some wars and battles": Conflict, Clans, and the Baja California Peninsula*

The Baja California Peninsula has long been thought of as a region occupied by low-density desert foraging peoples. The assumptions about the region outnumber the clearly understood aspects of its prehistory and indigenous peoples. While some hunting and gathering peoples exhibit relatively low levels of inter-group conflict, the Baja California Peninsula – along with the culturally affiliated regions of the lower Colorado River and western Arizona – are not such an example. Despite large portions of the landscape supporting relatively small populations, the 'oases,' –whether in the desert mountains, along rivers, or on Pacific islands like Isla Cedros –present areas of dense, and often contested occupation. The causes and consequences of landscapes divided not only by topography and ecology, but by socially constituted boundaries provide fertile ground for debate. Interestingly, the contested landscape can result in unexpected human ecological situations that can actually enhance sustainability, while in other instances, conflict can inhibit cultural interaction to the point that technological and social change are dampened. The most fascinating observation is that conflict is not only present among hunter-gatherers, but that its nature and intensity can deeply influence these societies in pervasive ways that cross-cut our traditional concepts of non-agricultural communities.

Desjardins, Sean (McGill University)

- [130] *Investing in Igunaq: Sea-Mammal Caching and Food Security among Thule and Historic Inuit, Foxe Basin, Arctic Canada*

Among Inuit in the Foxe Basin region of Arctic Canada, sea-mammal food resources acquired during summer months are regularly preserved for winter consumption through burial in shallow beach-gravel caches, where they are left to ripen for several months. The resulting meat, skin and blubber—collectively known as igunaq—is today considered a delicacy, but may once have been a vital winter staple, shielding Foxe Basin groups from the chronic food insecurity that often plagued Inuit in other regions. Unfortunately, our understanding of the mechanics and extent of both precontact and modern sea-mammal caching is limited. Recently, several hundred emptied gravel cache features were documented along a network of raised beach ridges abutting Pingiqualik (NgHd-1), a sizable Thule and historic Inuit (circa AD 1200 to 1960) winter site in northwest Foxe Basin. The large number of caches identified indicates not only that sea-mammal hunting has long been tremendously important to the subsistence economy of site residents, but also that an ethnographically-documented prohibition against the re-use of emptied caches appears to have been in effect for some time.

Desrosiers, Pierre [137] see Steelandt, Stéphanie

Desta, Dawit [155] see McPherron, Shannon

DeTore, Kathryn (University of Alabama) and Rebecca E. Bria (Vanderbilt University)

[105] *Explorations in Digital Data Collection in the Remote Andes of Peru*

After a successful test season of integrating iPads into field data collection in the rural highlands of Peru, the Proyecto de Investigación Arqueológico Regional Ancash (PIARA) continued to integrate digital techniques into all aspects of its data collection methodology. The most important addition to these methodologies was the inclusion of digital ceramic and textile analysis databases. Using a system that incorporates iPads, FileMaker databases, and a variety of applications for multiple functions, such as scaled and annotated drawings, translations, and diagrams, this methodology allows for greater consistency and efficiency in the recording of archaeological data. This serves to eliminate many sources of human error that arise during the post-processing stage. Further, by digitizing field and lab record sheets for various types of data into a relational FileMaker database, data was produced that is easily managed, referenced, and accessible. After two years of use in the lab and the field these preliminary explorations in paperless archaeology demonstrate the power of technology in streamlining the collection, processing and analysis of data from archaeological excavations.

Devès, Maud [215] see Bailey, Geoff

Dewar, Genevieve (University of Toronto)

[76] *Right Place, Right Time: Desert Dwellers during the Last Glacial Maximum in South Africa*

The Namaqualand rockshelter Spitzkloof A experienced pulsed human occupations at 51 ka, 19 ka, and 16 ka to 14 ka. These deposits provide evidence of humans inhabiting a semi-arid desert site in the Winter Rainfall Zone (WRZ) during mid-MIS 3 and MIS 2. These periods are not well represented in the archaeological record of more productive regions such as the southern Cape coast, which experienced severe marine regressions resulting in the drowning of ancient coastal sites. MIS 2-age paleoenvironmental proxies from the Summer Rainfall Zone, including the southern coast, have produced an overall signal indicative of a dry glacial period. By contrast, rare local paleoenvironmental indicators from Namaqualand and the data from Spitzkloof A are painting a picture of a more humid LGM in the WRZ with an expanding Succulent-Karoo plain as sea levels dropped. Fauna indicate an increase in primary productivity with an intensified use of the largest ungulates as compared with the slightly warmer MIS 3. These shifts indicate either a higher frequency of animals available or a change in demography and subsequent hunting tactics.

[76] *Chair*

Dewar, Genevieve [76] see Stewart, Brian

DeWitte, Sharon (University of South Carolina)

[190] *The Demographic Effects of Medieval Plague: Mortality Risk and Survival in Post-Black Death London*

The medieval Black Death (c. 1347-1951) was one of the most devastating epidemics in human history. It killed tens of millions of Europeans, and recent analyses have shown that the disease targeted elderly adults and people already in poor health condition. Following the epidemic, there were improvements in standards of living. This study investigates whether the combination of the selective mortality of the Black Death and post-epidemic improvements in standards of living had detectable effects on

health and mortality in London. Samples are drawn from several pre- and post-Black Death London cemeteries. The Guildhall Yard ($n = 75$) and St. Nicholas Shambles ($n = 246$) cemeteries date to the 11th-12th centuries and provide a pre-Black Death baseline. The St. Mary Graces cemetery ($n = 388$) was in use from 1350-1538 and thus represents post-epidemic demographic conditions. By applying Kaplan-Meier analysis and the Siler and Gompertz-Makeham hazard models to transition analysis age estimates, this study examines differences in survivorship and mortality risk between the pre- and post-Black Death populations of London. The results indicate that there are significant differences in survival and mortality risk between the two time periods, both of which suggest improvements in health following the Black Death.

Díaz Rocha, Ana María (Proyecto Regional Arqueológico San Bartolo-Xultun, Boston University)

[21] *Early Origins of Xultun: Use and Reuse of Monumental Architecture in the Maya Lowlands*

Recent archeological research at the site of Xultun has documented the existence of elite monumental architecture, located on the southern edge of one of the site's main plaza groups (group A). This group has roots deep in the Preclassic, and preliminary evidence reveals a likely shift in the group's function over time from residential to ceremonial. This paper addresses recently discovered evidence of early occupancy and the nature of the architectural complex where it was found. I discuss these preliminary investigations of this unusual triadic group, and place them in broader regional and political contexts. I also explore theoretical frameworks in order to compare and contrast similar examples of architectural use elsewhere in the Maya region.

Dibble, Harold (University of Pennsylvania) and Shannon McPherron (Max Planck Institute for Evolutionary Anthropology)

[10] *Developing a Standardized Methodology for Paleolithic Excavation and Analysis*

Over the course of excavating a number of Paleolithic sites during the past 25 years, the authors have developed several protocols for data retrieval designed to document an excavation, to help the excavation proceed quickly and efficiently, and to produce data suitable for immediate analysis. Here we present some of these protocols and discuss how they result in high level of data standards which, in turn, allows for strict comparisons and integration of data from all of our sites. The lack of such standards in other excavations, however, severely limits the extent to which data from other sites and studies can be incorporated into meaningful, quantitative analyses. While there is a clear need for more complete publication accompanied by adequate metadata, an important part of the solution is to develop software tools that enforce particular standards while simultaneously facilitating archaeological research.

DiBenedetto, Katelyn (University of Nevada Las Vegas) and Alan Simmons (University of Nevada Las Vegas)

[3] *Could Cyprus Have Sustained a Cattle Population between the Late Neolithic and the Bronze Age?*

One of the great enigmas of the early prehistory of Cyprus is the disappearance of cattle for over a millennium. The discovery of limited quantities of cattle remains from recent excavations at the early Cypro-Pre-Pottery Neolithic B (PPNB) sites of Shillourokampos, Ais Giorkis, and Arkosyko have demonstrated that there likely was a small founder population of cattle introduced to the island. Present archaeological evidence, however, suggests that cattle disappeared by the later Neolithic Khirokitia Culture and remained absent until the Bronze Age. This situation differs drastically from the mainland and other Mediterranean islands in which cattle are found continuously from the Neolithic onwards. It has been suggested that this disappearance may have been due to ecological reasons, in particular that cattle herding strategies and subsistence patterns were not compatible with later full-scale Neolithic villages in a restrictive island context. The purpose of this

presentation will be to examine both the past and present feeding and foraging requirements for cattle and the environment of Cyprus from the Neolithic to the Bronze Age to determine if the colonists could have sustained a cattle population. If so, other reasons for their late Neolithic disappearance will be explored.

Dick, Lyle [221] see Dawson, Peter

Dickson, Catherine

[53] *Discussant*

Diederichs, Shanna (Crow Canyon Archaeological Center), Scott G. Ortman (Crow Canyon Archaeological Center), Kari L. Schleher (Crow Canyon Archaeological Center) and Mark D. Varien (Crow Canyon Archaeological Center)
[287] *The Neolithic Revolution in the Pueblo World: New Evidence from the Basketmaker III Period in Southwestern Colorado*

Ancestral Pueblo farmers settled the central Mesa Verde Region of southwestern Colorado in the seventh century A.D. This settlement was part of an important episode in the history of the U.S. Southwest, when a new technological package—including maize suitable for direct precipitation farming, cooking pottery, beans, and turkey husbandry—enabled the rapid expansion of ancestral Pueblo populations and a material culture horizon in the archaeological record. This local version of the Neolithic Revolution led to the formation of Mesa Verde society, which culminated in the famous 13th century cliff-dwellings of Mesa Verde National Park and adjacent areas. The Basketmaker Communities Project (BCP) seeks to understand the changes in social organization that accompanied the initial formation of this ancient society. The BCP has implemented surface mapping, geophysical imaging, and excavation to investigate a public building and associated settlement cluster dating to the Basketmaker III period. In this paper, we introduce this project and use results from the first two seasons of field work to address three models of community organization suggested by previous research. Preliminary results suggest that several social institutions characteristic of later ancestral Pueblo communities were coeval with the Neolithic Revolution in this area.

Dietler, John [102] see Hoffman, Laura

Dietler, John

[102] *Mission and Pueblo: The Mission Period Archaeology of San Gabriel and Los Angeles*
For more than 150 years, the roots of America's second largest city lay buried, forgotten, beneath the megalopolis that grew up around them. In 2012, two large, multidisciplinary archaeological research projects in the Los Angeles area have begun yielding important insights to the region's Mission period and interpreting them to the public.

The ACE San Gabriel Trench Project, the first data recovery at the San Gabriel Mission, explored the mission's garden and granary, producing a rich array of information on subsistence, production and exchange, and technology, including the foundation of a revolutionary 1823 gristmill. A major outreach effort educated more than 3,000 members of the public about archaeology and California history.

The LA Plaza Project included the analysis of approximately 130 sets of human remains and associated grave goods from the Pueblo of Los Angeles' Plaza Church Cemetery, which operated from 1822 through 1844. The analysis explored the population's health, economic status, and cultural practices and revealed a community that incorporated a complex mixture of Native American, and Euroamerican, ethnicity and traditions. Extensive

efforts were undertaken to - consult with groups representing the descendants of the people buried in the cemetery.

[102] *Chair*

Dietler, Sara

[102] *To the West of the Mission: Artifacts and Mortuary Patterns of a Nineteenth-Century Los Angeles Pueblo Cemetery*

The Los Angeles Plaza Church Cemetery was in use from 1822 to 1844, a transformative period for the young Pueblo of Los Angeles. This era coincided with the secularization of the missions, a time of transition for Native American and non-native populations formerly connected to the mission system.

Archival records indicate that the cemetery included Catholic Native American and Hispanic burials. Artifacts recovered from burials in the cemetery provide an unparalleled opportunity to study the transition of people and power from mission to pueblo, and to examine the retention of Native American cultural traditions, or lack thereof, within a Spanish Catholic context. Patterning of the assemblages within individual burials and between burials also presents a sample of typical artifacts found during this period that can be studied in the larger context of the Spanish Colonial period. This paper examines particular artifact types that occur repeatedly in the burials, such as Phoenix buttons, various styles of rosaries, crosses, religious devotional medals, and beads. In conjunction with the population demographics of the cemetery, this data provides a better understanding of the mortuary traditions of this era and the ways they may differ within the communities represented in the cemetery.

DiGangi, Elizabeth (ICITAP-Colombia)

[38] *Taphonomic Evidence of Ancient Carnivore Modification in a Chullpa Machay Tomb from the Site of Hualcayán, Callejón de Huaylas Valley, in Peru's Northern Highlands*

Recently, a Chullpa-Machay tomb was discovered at the site of Hualcayán by the Proyecto de Investigación Arqueológico Regional Ancash (PIARA). As extensive looting had taken place, surface collection was undertaken in two chambers to protect the tomb and its contents. Several hundred human bones were recovered, with a minimum of 24 adults and six subadults. Six adult bones (three clavicles, two humerii, and one tibia) show evidence of perimortem carnivore modification. The clavicles have several puncture marks at the acromial ends with evidence that the bone was still fresh when the marks occurred (i.e., "hinging" of bone fragments inside the puncture mark). The altered humerii and tibia show scalloped and crushed margins on the epiphyseal ends as well as possible scoring marks. These indicators are consistent with carnivore chewing during the perimortem period (near death, while the bone was still wet or fresh). The shoulder joint is the most attractive one to carnivores, dogs in particular, as its anatomy allows easy disarticulation. Evidence of carnivore modification on bones inside the tomb indicates that dogs had access to the tomb after the placement of bodies. The importance of taphonomy in archaeological contexts to uncover human and non-human behavior will be presented.

Diggs, David [75] see Montgomery, Christine

Dikomitou-Eliadou, Maria [178] see Müller, Noémie

Dillehay, Tom [103] see Chiou, Katherine

Dillehay, Tom (Vanderbilt University)

[165] *Discussant*

Dillian, Carolyn (Coastal Carolina University), Emmanuel Ndiema (National Museums of Kenya) and Purity Kiura (National Museums of Kenya)

[225] *Modeling Mid-Holocene Pastoral Interactions along Lake Turkana, Northern Kenya*

Excavation of mid-Holocene sites in the vicinity of Koobi Fora in northern Kenya has yielded evidence of regional interactions that may have shaped patterns of subsistence for pastoral and non-pastoral groups. Specifically, evidence of obsidian exchange, revealed through portable X-ray fluorescence analysis, shows networks that must have at least partially relied on watercraft, raising questions about use of other lacustrine resources as well. As such, the transition from hunting-gathering-fishing to pastoral economies may have been more flexible than previously thought and may have involved extensive interactions through the mid-Holocene.

DiMare, Tianna [69] see Graesch, Anthony

DiNapoli, Beau [274] see Lane, Brian

Dirkmaat, Dennis (Mercyhurst University)

[193] *The Two Faces of Forensic Archaeology*

Forensic archaeology as it is currently configured has two personae or operational models. One purports that the role of archaeology in the umbrella milieu of forensic science is to simply gather field data with varying amounts of rigor and then turn it over to "specialists" for further analysis and interpretation. The other model advocates that archaeology plays a critical and central role in the entire data collection, data analysis, and interpretation process. Additionally, the second view insists on the application of the most precise and technologically sophisticated field and laboratory protocols now in existence. The two approaches are examined and contrasted and the data collecting only model is rejected. The role of forensic archaeology in the broader milieu of anthropology is also examined and its status as a stand-alone sub-discipline is evaluated.

[193] *Chair*

Dirkmaat, Dennis [193] see Cabo, Luis

Ditchfield, Kane (The University of Auckland) and Simon Holdaway (The University of Auckland)

[90] *Stone Artifact Assemblage Formation and Patterns of Human Movement: Results from Two Pleistocene Cave Sites, Bone Cave and Mackintosh 90/1, South-Western Tasmania, Australia*

We apply a methodology developed by Dibble and colleagues (2005) to two Pleistocene stone artifact assemblages from Bone Cave and Mackintosh 90/1 in south-western Tasmania, Australia. This method, the cortex ratio, quantifies artifact transport as a proxy for human movement by comparing the expected cortical surface area and volume that should be present in an assemblage if all the products of reduction remain with that which is actually observed in the assemblage. This is based on large samples from each assemblage. The results indicate that both cortex and artifact volume are under-represented at Bone Cave and Mackintosh 90/1 compared to what is expected should everything remain. This suggests that cortex covered nodules were transported to both cave sites, reduced and large cortical flakes were removed for use elsewhere at the end of each occupation. The continued repetition of this process structured long-term assemblage formation where both cave assemblages reflect anticipated activities which took place away from the caves. Because this pattern was created by the human movement of artifacts over time, it suggests that human mobility was an important pattern in Pleistocene south-

western Tasmania.

Dittmar de la Cruz, Katharina [272] see Arriaza, Bernardo

Ditto, Emily (Univ. of North Carolina) and Erin Nelson (Univ. of North Carolina)

[43] *Symbolically Significant Substances and Cosmologically Connected Objects: What Do They Do?*

Concepts of materiality have recently become important in archaeology and provide key perspectives for understanding social relations and meaning in the past. Some studies have focused on the sensual qualities of substances as materializations of ideas (DeMarrais et al. 1996). Others have discussed the ways objects actively become part of social practices (Gosden 2005). We suggest that combining these approaches can help us better understand how the material qualities of objects affected power relations in the past. Our respective research has found that objects with particular qualities (material, source, color, etc.) played key roles in accessing connections between specific cosmological domains and forces during human politico-ritual action. Caches of symbolically significant objects from the ancestral Pueblo world of Chaco Canyon suggest that using these objects to control inherently linked cosmological phenomena and forces may have helped legitimize the politico-ritual power of leaders. At Parchman Place, a late Mississippi period site in the northern Yazoo Basin, incorporating symbolic ash and other substances into earthen mounds linked the community to the broader cosmos via an axis mundi, thereby situating leadership firmly in the context of shared community values.

DiVito, Nathan (Center for Archaeological Research)

[92] *Message in a Bottle: The "Heim" Zouaves*
On May 5, 2011, a sealed, Hutchinson style, glass bottle containing two handwritten documents was recovered during archaeological monitoring activities associated with Phase III of the San Antonio River Improvements Project. Monitoring was being carried out under contract with the San Antonio River Authority by the Center for Archaeological Research at the University of Texas at San Antonio. The intact letters were later removed from the bottle and transcribed. This presentation discusses the results of the archival research that indicate the letters were written at the first encampment of the Texas Volunteer Guard at Camp Stoddard and date to July 12, 1890. The letters specifically pertain to the "Heim" zouaves, an 18 member volunteer group which was present at the encampment.

Dixon, Kelly [120] see Auge, C Riley

Dixon, Boyd (TEC Inc.)

[195] *The Role of Okinawan Ethnohistory and Ethnography in Understanding Pre-WWII Land Use and Settlement Patterns on Tinian, Commonwealth of the Northern Mariana Islands.*

Polynesian and Melanesian ethnographies and ethnohistories of preindustrial societies have been used to generate models providing a theoretical underpinning for much archaeological research worldwide for over a century. Similar studies with Micronesian and western Pacific societies were rarely undertaken since these islands had long been developed by colonial Spain and later by imperial Germany, Japan, and the U.S. military. This paper compares two islands often linked in the modern archaeological literature by a common heritage in the final decades before and during WWII: Tinian in the Commonwealth of the Northern Marianas and Okinawa in Japan. Proposed similarities in early 20th century patterns of land use and settlement between the two islands are explored, as are

differences not readily observable in the field. It is argued here that cultural parallels do indeed exist on Tinian, but the archaeological record alone is often insufficient to capture many subtleties of the landscape in the absence of a comparative framework provided by Okinawan ethnohistory and ethnography.

Dixon, Christine (University of Colorado, Boulder)

- [210] *Questioning the Role of Manioc Agriculture and Farmer Autonomy: Agricultural Organization and Manioc Farming at Cerén, El Salvador*

Recent research at the Cerén site in El Salvador has documented data central to many theoretical discussions of Classic Period Maya political economies and agricultural production, due to the extraordinary preservation of the site. Agricultural data include the remains of multiple intensively cultivated manioc fields (the extent of which are still unknown), evidence of field boundaries, and indications of stylistic planting differences in both maize and manioc fields. Furthermore, all of the manioc fields so far documented at Cerén were harvested just before the Loma Caldera eruption, perhaps indicating the presence of supra-household harvest organization and cooperation, either formal or informal, in manioc processing. This paper discusses the 2007, 2009, and 2011 evidence for Cerén manioc cultivation, as well as the contemporary manioc test plots grown and harvested in 2012 that offer insights from experimental archaeology. This evidence informs discussions of Classic Period Maya farmer autonomy, the role of manioc farming in subsistence, and the presence or absence of political oversight, as well as supra-household organization and labor in agricultural production.

- [210] *Chair*

Dobereiner, Jeffrey (Harvard University)

- [234] *Putting Them in Their Place: Interpreting Preclassic Maya Settlement and Ceremonial Space at Rancho Búfalo, Chiapas, Mexico*

Approaching urban centers as an elite tool to alienate subjects from "sacred and secular power" was proposed by Paul Wheatley in his seminal 1969 work, "City as Symbol." While this notion can best be tested within the earliest manifestations of urban generation, archaeologists are often forced to use interpretive lenses of space and place, which have been constructed from the remains of the final occupants of a given region. The Maya area is no exception - Preclassic settlement patterns and households often lie deep beneath later Classic period structures, plazas, and fill. This poster describes new excavations at Rancho Búfalo, Chiapas, Mexico, a Middle and Late Preclassic (600 BC - 100 AD) archaeological site located approximately 40 km East-Northeast of Piedras Negras, Guatemala. Rancho Búfalo has a clearly delimited civic-ceremonial space with monumental architecture bounded by an arroyo on three sides, with apparent house mounds both within and without this enclosed core. As the site contains nearly no Classic period overburden, it presents an unusual opportunity to explore hypotheses surrounding socioeconomic positioning, provisioning and built environments of the Preclassic period.

Dobney, Keith [20] see Larson, Greger

Dodd, Walter (CSU-Fresno)

- [16] *On the Face of It: Rethinking the Cliff Dweller Phenomenon*

In some parts of the American Southwest after AD 1000, sedentary maize farmers gave up their customary preference for open-air settlement and chose instead to reside in the natural recesses of sheer cliffs. The circumstances that led to such a drastic change have long been the subject of speculation, yet no significant breakthroughs have emerged to begin solving the

problem. In this paper I lay out a coherent evolutionary explanation for the sudden shift in settlement tactics. I consider why agriculturalists initially moved into the canyon-wall niches, stayed for short periods, and never returned. Intensive use of rock overhangs is shown to be a rational adaptive strategy that initially succeeded but ultimately failed. Several disparate lines of evidence are brought together to forge a new working hypothesis, one that potentially brings greater clarity to a puzzling set of facts.

Dodge, Robyn (The University of Texas at Austin)

- [290] *Hun Tun Social Complexity*

Maya Household archaeology provides a platform for inquiry into every social actor of Maya civilization. Households serve as microcosms providing insight into larger social processes operating within complex civilizations. Additionally, ancient commoners and their households constitute the bulk of Maya civilization. The Maya site, Hun Tun is located in northwestern Belize on the Programme for Belize Property. Research at Hun Tun focuses on a household oriented study examining how households contribute to ancient Maya social complexity. This paper discusses information pertaining to Maya hinterland complexity at the household level. Through the examination of data sets arguments can be made, in favor of, social complexity operating at commoner settlements. Hun Tun archaeology serves as a strong candidate for hinterland complexity at the household level. Data sets to support Hun Tun social complexity include settlement patterns, architecture, a chultun, and limestone megaliths. These are among the features discussed. Artifact assemblages such as lithics, ceramics, obsidian, seashell and greenstone are also discussed in context.

Dodo, Yukio [194] see Adachi, Noboru

Doelle, William (Archaeology Southwest)

- [110] *What is Preservation Archaeology?*

The practice of Preservation Archaeology seeks to optimize what remains for future exploration and discovery. It is an approach with deep historical roots. I see it as an evolving ethic that reflects the thoughts and actions of a diverse community of people, all of whom have found meaningful connections to the past. In this overview paper I will cover some of the historical highlights and will lay the groundwork for the diverse presentations in this session. I will briefly touch on one of the challenges that comes into focus through the lens of Preservation Archaeology—archaeological field schools. Archaeology Southwest has been developing a Preservation Archaeology field school curriculum in partnership with the University of Arizona School of Anthropology and a rural landowner in southwestern New Mexico.

- [110] *Chair*

Dogandzic, Tamara (Max Planck Institute for Evolutionary Anthropology), Shannon McPherron (Max Planck Institute for Evolutionary Anthropology) and David Braun (George Washington University)

- [155] *Estimating Blank Edge Length and Surface Area: A Comparison of Methods Using Digitized Images*

Efficiency of raw material usage is an important component of studies of technological organization. Efficiency is often quantified using measures of edge length or surface area relative to flake blank mass. This feature of technological organization is important in studies of use life, and transport. These aspects are mainly estimated from linear measurements. There are, nevertheless, several ways to measure the length and width of lithic artifacts, and one method in particular has been proposed as a better estimate of edge length. Here we compared four different length and width measurement methods to assess which of these most accurately predicts surface area and edge length. For this analysis

we made an experimental lithic assemblage using two different raw material types. Using digitized images we obtained 2D surface area measurements and edge lengths. These were compared with the results obtained by the different length/width measurement systems. This study has implications for further developing and standardizing the methodology of lithic analysis in order to better facilitate assemblage comparisons and to better address behavioral issues.

Dogandžić, Tamara [155] see McPherron, Shannon

Dogiamia, Lilian (McMaster University)

[90] *Defining the Point: Arrowhead or Spearhead? The Case of the Çatalhöyük Projectile Points*

In this paper I explore the history of research on distinguishing different types of projectile technology (spears, arrows, darts), before then turning to the results from the study of the Çatalhöyük projectiles.

At Çatalhöyük hunting was taking place in the context of a primarily agro-pastoral community where it features prominently in iconography. The ability to classify arrowheads and spearheads is deemed important in this context, as these weapons imply the use of two separate hunting techniques, namely hunting with a bow and arrow and hunting with a spear. These techniques have different socioeconomic (e.g., different point types might signify functional differences) and symbolic (e.g., hunting rituals, differences in performativity and skill) implications for the history and people of Çatalhöyük.

Drawing on North American literature, I have employed two different methods for distinguishing between arrowheads and spearheads proposed by Patterson (1985), Thomas (1978; developed further by Shott [1997]).

Doherty , Chris [32] see Marciniak, Arkadiusz

Doi, Naomi [138] see Yoneda, Minoru

Dolan, Patrick (Washington State University) and Kristin Safi (Washington State University)

[77] *An Agent-Based Model of Hunter-Fisher-Gatherer Cultural Transmission and Fission-Fusion Dynamics*

Understanding how varying group size and temporal cycles of interaction affect trait diversity in archaeological assemblages is critical to empirically measuring cultural transmission among prehistoric hunter-fisher-gatherers. Although common cross-culturally, fission-fusion processes are inherent in the seasonal and inter-annual movements of many hunter-fisher-gatherer populations in response to changing resource distributions. Efforts at characterizing cultural transmission among these populations has not yet addressed the effects that these systematic changes in group size and structure intrinsic in periodic aggregation and dispersal may have on cultural trait diversity. Agent-based modeling provides an opportunity to evaluate these effects within mobile populations. Using a model of unbiased social learning, we examine variability in group size, population size, as well as the frequency and spatial structure of fission-fusion events affect the diversity of traits within and between groups. We further suggest that as fission-fusion processes are not unique to hunter-fisher-gatherers these results may be applicable to a wider range of societies which undergo momentary change in group size and structure.

Dolan, Sean [85] see Cordero, Robin

Dolan, Sean (University of Oklahoma) and Kathryn Putsavage (University of Colorado)

[86] *Projectile Point Typologies, Obsidian Sources,*

and Social Transformation in the Mimbres Valley, New Mexico, A.D. 1000-1450

Comparing projectile point typologies is a way to explore occupational history in the archaeological record. This research combines point typology with obsidian X-ray fluorescence chemical sourcing to expound on social transformations that occurred throughout the Mimbres Valley between A.D. 1000 to 1450. Numerous obsidian points have been found at the Black Mountain site (LA 49) which is the type site for the Black Mountain phase (A.D. 1130-1250/1300). We compare this obsidian assemblage with Classic Mimbres phase (A.D. 1000-1130) projectile points to track obsidian exchange networks throughout the Mimbres Valley. Differences or similarities among point typology and obsidian sources through time can provide a better understanding of tool manufacture, point type distribution and obsidian exchange networks as well as changes in occupational history and social transformations in southern New Mexico

Dolfini, Andrea [98] see Crellin, Rachel

Dolph, Brittany (UCLA/Getty Conservation Program) and Christian Fischer (Material Science and Engineering, UCLA; UCLA/Getty)

[253] *Sandstone Raw Materials from Eastern France: Evaluation of Non-Invasive Portable Technologies as Potential Tools for Characterization and Sourcing*

In the Alsace region of eastern France, sandstone is an important local resource which has been utilized by societies throughout time. Although earliest archaeological evidence of usage dates back to the Neolithic, it is mainly during the Gallo-Roman and Medieval periods that this sandstone was extensively quarried, and nowadays is still commercially exploited for building and conservation purposes. Primarily composed of quartz, feldspars, and various types and amounts of micas and clay minerals, the sandstone types present variegated colors and belong to different levels of the Buntsandstein, a lithostratigraphic unit of lower Triassic age. This research explores the potential of X-ray fluorescence (XRF) and ultraviolet/visible/near infrared (UV/Vis/NIR) spectroscopy for the non-invasive characterization of different Buntsandstein sandstone lithotypes using portable instrumentation. The two complementary non-invasive techniques allow identification of both elemental and mineralogical compositions while providing a useful alternative for the analysis of archaeological artifacts and/or field investigations where sampling is not an option. Furthermore, they can be used to document current condition and possible alteration processes in order to identify decision-making criteria for conservation treatments. Preliminary results obtained on reference samples from modern quarries exploiting the Buntsandstein sandstone will be presented and discussed with particular focus on provenance and sourcing.

Domett, Kate (James Cook University, Australia), Caitlin Evans (James Cook University, Australia), Nancy Tayles (University of Otago, New Zealand) and Nigel Chang (James Cook University)

[219] *The Influence of Sociocultural Change on Osteoarthritis in Prehistoric Ban Non Wat, Thailand*

Osteoarthritis is the most ubiquitous joint disease in both modern and ancient skeletal samples. Its multifactorial aetiology and an incomplete understanding of its exact pathogenesis have led to debate around the interpretation of this disorder in prehistoric skeletal collections, particularly with reference to human behavior and activity. Despite limitations in interpretation, the fact remains that osteoarthritis is frequently observed and can lead to pain, limited mobility and disability. The prehistoric community of Ban Non Wat in northeast Thailand spans over 2000 years from early Neolithic times to late Iron Age. From a biocultural perspective, this temporally continuous sample of skeletal remains provides a rare opportunity to look at the development of health through time within a discrete environment. Overall, the community showed the

highest levels of osteoarthritis in the shoulders, elbows, knees and feet with some noticeably consistent patterns through time; however preservation issues have limited statistical analyses. Unilateral degeneration was common suggesting a mechanical influence was dominant over genetics. We will consider how changes in sociocultural practices, such as subsistence mode, have influenced the prevalence of osteoarthritis and the degree of associated mobility and activity in Ban Non Wat and in the wider context of prehistoric northeast Thailand communities.

Domínguez, María del Rosario [33] see Rivas, Javier

Domínguez, María del (Universidad Autónoma de Campeche), Yolanda Espinosa (Universidad Autónoma de Campeche) and Javier Reyes (Universidad Autónoma de Campeche)

[290] *Analysis of the Deterioration by Salt Crystallization of the Polychrome Stucco Masks of Edzna, Campeche, Mexico*

The alteration of the stone materials, such as those derived from the limestone in archaeological buildings, is a very complex issue due to the large number of factors involved in its deterioration. Among these factors are the action of the weather, the presence in the stone of soluble salts and atmospheric pollution causing the loss of property in the archaeological materials that make up the cultural heritage of Mexico.

Several samples of polychrome stucco from masks on Structure 414 and the Building of Five Floors from the archaeological site of Edzna, Campeche, Mexico were selected for analysis. These samples were chosen based on the high degree of deterioration in the stucco itself, with the aim of offering proposals for future intervention and conservation.

The samples of polychrome stucco were characterized by analytical techniques such as Scanning Electron Microscopy (SEM-EDX), X-Ray Fluorescence (XRF), Stratigraphic Analysis by Electron Microscopy Optics (MO), Fourier Transform Infrared Spectroscopy (FTIR). Measurements of temperature and relative humidity were taken in the same areas on the large masks from which the stucco samples were taken. This atmospheric data was obtained from the sensors of a weather station placed in the sampling site to register the micro-environmental variation.

Donaldson, Milford Wayne FAIA (California State Historic Preservation Officer)

[13] *The Preservation of California's Military Cold War Era Cultural Resources*

During the Cold War Era, from the end of World War II to the fall of the Berlin Wall, the architecture of California military bases reflected three somewhat contradictory trends.

First, for the comfort of its troops, especially the officer corps, the military built administrative and residential buildings that were commodious and fashionably modern. Second, the military valued nimbleness and flexibility in its training and employed temporary buildings for most operational purposes. Third, the military in California was heavily involved in weapons development, giving California bases hundreds of very permanent and very odd looking research and test facilities.

The architecture of the Cold War in California is disjointed, lacking style definition and continuity of design and therefore is difficult to understand, rehabilitate for another use and preserve. Security of these resources is such that the general public is not aware of their historical and cultural values.

Mr. Donaldson will discuss issues outlined above; update the current concerns with Department of Defense installations and the challenges of closures and preservation of cultural resources.

Donham, Theresa

[53]

Discussant

Donyina, Addy [23] see Reese, Kelsey

Doonan, Roger and Peter Hommel (University of Oxford)

[93] *Between Ideas and Objects: The Doings of Invention in Pottery and Metallurgy*

Invention (in venire) describes the bringing forth of ideas into the material world. It is found neither in ideas, nor objects but rather in the strands of practice, which connect them.

Archaeologists have recently returned to the study of invention, particularly the invention of sophisticated pyrotechnologies, using new evidence and techniques to support grand narratives of emergence, dispersal and development. However, by tracking objects and talking about ideas, broad material processes, such as pottery, have been extended as conceptual unities across space and time irrespective of the specific cultural practices and social conditions, which gave rise to them.

Though presenting no concrete solutions, nor advocating a retreat to a disconnected micro-scale, this paper explores the potential of incorporating the study of practice into discussions of early pyrotechnology. It considers the different approaches in ceramic and metallurgical analysis and emphasizes the importance of understanding the place of pyrotechnologies in their contemporary social web. Drawing in examples from the recently recognized hunter-gatherer pottery of East Asia and North Africa and the emergence of metallurgy in the Southern Aegean and Central China an attempt is made to create new frameworks in which to explore the context of invention, reinvention, innovation and transmission.

[288]

Discussant

Dorenbusch, Wendy (California State University, Los Angeles)

[256] *Scratching the Surface: A Preliminary Chronology of the Northwest Settlement of Cahal Pech, Belize*

Over the last two field seasons the author has conducted a settlement pattern survey of the northern and southern peripheries of the site of Cahal Pech with the Belize Valley Archaeological Reconnaissance. The survey has documented dense settlement as well as extensive modification of the natural landscape. A total of 535 mounds in a variety of configurations ranging from single mounds to multi-structure plazuela groups have been recorded in an area of approximately 12 square kilometers. The landscape modifications include chultuns, terraces, dams, and retaining walls. From the survey's surface assemblage, ceramic analysis points to a long lived occupation dating from the Protoclassic to the Terminal Classic. Of concern here is the lack of evidence dating to the earliest periods known from the site core. Some of the issues related to this problem will be discussed in the context of the northwest periphery. A large quantity of mounds and surface scatters where documented in this area; however, due to years of modern agriculture, the archaeological record has been disturbed. Drawing on artifact typologies, this paper presents a preliminary chronology for the northwest settlement of Cahal Pech.

Dorland, Steven (University of Toronto)

[259] *Shifting Perceptions of Pottery Decoration: A Multi-scalar Analysis of Two Middle Iroquoian Villages in Southern Ontario*

Pottery decoration analysis has played an integral part in understanding and constructing past lifeways of southern Ontario pre-contact groups. Throughout the years, a number of methodological approaches and theoretical paradigms have influenced our understanding of Late Woodland pottery. This paper demonstrates the effectiveness of applying a multi-attribute

analysis, influenced by Smith (1997), to pottery decoration. I have selected two Middle Ontario Iroquoian sites, the Antrex site and the Holly site as my research areas. I have chosen three variables to demonstrate the effectiveness of a multi-attribute analysis: the design motif, the nature of symmetry patterns, and the relationship between the interior decoration and neck decoration. The selected variables represent aspects of decorative variation that are often missed or not even considered in Iroquoian studies, but are still important variables to consider when performing attribute analysis. The overarching goal of this paper is to demonstrate regional variation and a form of stylistic continuity that is masked by traditional typological approaches that focus on style from a single scale perspective. By adopting a multi-scalar approach, a more complex understanding of the relationship between pottery decoration and social, political and ideology processes, starts to unfold.

Dortch, Joe [263] see Bunce, Michael

Dorwin, John

[128] *Kalispel Foraging Practices and Optimizing Foraging Theory*

The Kalispel are an Interior Salish speaking people of the mountains and valleys of eastern Washington, northern Idaho and western Montana. They are included within the Plateau culture area with its emphases on salmon fishing and wild root harvesting. Kalispel subsistence included significant amounts of deer and fish, especially west slope cutthroat and bull trout, mountain whitefish and suckers. Salmon were not locally available as they were not able to reach the Kalispel homeland on the middle and upper Pend Oreille River. Despite this salmon were very important to the Kalispel and were taken annually in large quantities from fisheries 75 or more kilometers away, dried and transported home for later use. Beginning about one hundred-fifty years ago the introduction of the horse permitted even larger quantities of salmon to be transported than previously. And like other Plateau peoples, some Kalispel began to travel hundreds of kilometers to the plains of central Montana to hunt bison dry the meat and transport it home by horse. These examples of distance foraging are examined in light of recent discussions among archaeologists.

Dorwin, John [224] see Truman, Elizabeth

Doucette, Dianna (PAL and Harvard University), Elizabeth Chilton (University of Massachusetts Amherst), Katie Kirakosian (University of Massachusetts Amherst), Evan Taylor (University of Massachusetts Amherst) and David Foster (Harvard Forest, Harvard University)

[207] *Evaluating the Drivers and Triggers of Ecosystem Dynamics: Disturbance, Climate, and People*

In this poster we describe the archaeological component of a larger NSF-funded research project intended to analyze the drivers of ecosystem dynamics. The archaeological component of this project aims to determine the role of human activity (fire, land clearance, horticulture) in shaping vegetation dynamics. While the interpretation that pre-contact Native American land-use played an increasing role in landscape dynamics through the Holocene is prevalent in the literature, there has never been a robust analysis of relevant archaeological and paleoecological data on the subject. Some of the specific alternative hypotheses examined in the archaeological analysis include: (1) do we see progressively intensive cultural development and increasingly intensive land use throughout the pre-Contact period?; (2) do we see cultural continuity with fairly passive responses to environmental change and minimal ecological impact of people?; or (3) is cultural adaptation environmental and/or cultural specific, with clear influence of human agency? We present preliminary results from the analysis of state-wide site archaeological data and more detailed analysis of data from three subregions in Massachusetts: Martha's Vineyard, the Tauton River Basin, and the Deerfield

River Valley, which represent three contrasting cultural landscapes: a near-coastal lowland, a habitat-rich island, and an inland river valley.

Douglas, Diane

[31] *Discussant*

Douglass, Matthew [5] see Lin, Sam

Douglass, Matthew (University of Nebraska) and Sam Lin (University of Pennsylvania)

[148] *Local Lithic Source Utilization Patterns in the Oglala National Grasslands, Northwest Nebraska*

Recent study in the Oglala National Grasslands in far Northwest Nebraska has employed a landscape approach to the documentation and analysis of chipped stone artifact distributions. Results indicate that a large portion of these materials are comprised of locally available Chamberlain Formation cobbles. Here we present the results of an analysis of these local source materials recovered from a prominent cobble exposure known as Pete Smith Hill. Sampling techniques were employed throughout the locality to examine the composition (e.g. lithology, cobble size, and shape) of these deposits. In addition, artifact distributions within these sample locations have been analyzed to determine how variation in these source materials has influenced procurement and artifact production strategies. Special emphasis was placed on evaluating the preferential selection and transport of lithic products away from these locations as evidenced by artifact material characteristics, core reduction intensity, flake production techniques, and the quantification of cortex proportion.

Dowd, Anne S. [142] see Trubitt, Mary Beth

Dowd, Anne S. (ArchaeoLOGIC USA, LLC)

[230] *A Building Block of Anthropological Archaeology: Argument by Anomaly*

Anthropological archaeologists may evaluate data anomalies to determine if they can be explained through physical or social phenomena. This position can be compared to "argument by anomaly," or trying to explain anomalous situations as a way of understanding the heterogeneity of the past. Gould's "argument by anomaly" was a point of contention with Binford and a point of convergence with Saggers and others, such as Lemonnier. The concept of looking for disjunction between the expected and observed has been a productive approach for stone tool analysis. A perspective with broad utility for archaeological data, Gould's contributions are explored and discussed.

[166] *Chair*

Dowdall, Katherine [111] see Wingard, John

Downey, Jordan [19] see Millaire, Jean-Francois

Downum, Christian (Northern Arizona University)

[97] *Pars Pro Toto: Synecdoche and the Interpretation of Tucson Basin Trincheras Sites*

Pars pro toto describes the practice of using a portion of a phenomenon as the name for the whole thing. It is a special form of synecdoche, a figure of speech in which the whole refers to a part, or vice versa. Calling Tucson Basin hillside sites "trincheras," based on the presence of terraces both great and small, represents a pars pro toto that historically helped to obscure the true nature of these places. In this paper I review the history of archaeological investigations at Tucson Basin hillside sites, focusing on the complex nature of their formation and changing

ideas about their roles in ancient desert societies. I argue that in this archaeological case as in many others, choice of descriptive language has profoundly affected the framing of our interpretations and debates.

Doyel, David (Barry M. Goldwater Range, USAF, Arizona)

[64] *Grasshopper and after in the Southwest US*

The University of Arizona Archaeological Field School at Grasshopper Pueblo on the White Mountain Apache Indian Reservation was my hands-on introduction to the archaeology and prehistory of the American Southwest. What had started as a fallback position eventually grew into a long-term commitment. After the 1971 season at Grasshopper I enrolled at the University of Arizona and in a few years a career agenda in Southwestern archaeology began to crystallize. Issues, perspectives, and methods learned at the field school stayed with me, and the introduction to a variety of topics served me well as I continued my education and conducted original research into the cultural traditions of the region. One topic of particular relevance in my research that was a direct result of Grasshopper is the concept of the Salado culture. In retrospect and more generally, the growth of my career has its roots in the Grasshopper experience. And not to be undervalued is the camaraderie and lifelong acquaintances and friendships initiated those decades ago in the White Mountains of Arizona.

Doyle, James (Brown University)

[171] *Laguna-Front Property on The Lower East Side: An Elite Preclassic Residential Platform at El Palmar, Petén, Guatemala*

This presentation reports results from excavations in a large platform (Platform E5-7) at the site of El Palmar, Guatemala. As early as 1300 BC, El Palmar was a maize farming community, and in the early Middle Preclassic period, the population built up the platform in question at approximately the same time as the "E-Group" principal plaza. Another planning and expansion episode at El Palmar extended the platform and its large paved patio. Archaeological evidence combined with the primacy of the platform in the Late Preclassic site plan both suggest that the platform served as the residential "compound" of El Palmar's elite for many centuries. After a period of disuse and perhaps abandonment in the Late Preclassic-Early Classic transition, people reoccupied the platforms and Preclassic household foundations. The Early Classic reoccupation perhaps coincided with two important ritual events: first, a large deposit of polychrome and utilitarian pottery along with other material at a small temple on the edge of the Laguna El Palmar; and second, the interment of a high-status burial in a large vaulted tomb on the main east-west axis of the Preclassic Triadic Group. Both events suggest Classic Period peoples consciously connected with meaningful spaces of their Preclassic predecessors.

Doyle, James Doyle [288] see Bishop, Ronald

Dragomir, Ana-Maria [42] see Lockau, Laura

Drake, Stacy

[57] *Considering Burials as Units of Materiality*

The traditional analysis of mortuary data examines the material goods found with the human remains of a burial and considers the purpose or function that such goods served for the interred individual. Performing this method of "material" analysis can yield useful conclusions regarding the deceased individual and the corresponding artifacts. However, applying this same "material" interpretation to the burial unit as a whole (including osteological remains, artifacts, and architectural context) might prove even more useful by considering what possible intentions might lie

behind the practice of human burials, and the ways in which such burials might be utilized by living members of the community to manipulate social relations. Focusing on specific excavations from the ancient Maya of Northwestern Belize, this presentation argues that mortuary events should be considered as singular entities from a material perspective in order to provide a more thorough analysis of mortuary practices involving both the deceased and the living.

Draut, Amy [125] see Fairley, Helen

Drennan, Robert (University of Pittsburgh)

[144] *Discussant*

Drigo, Marina [248] see Slater, Philip

Driver, Jonathan [116] see Maxwell, David

Driver, Jonathan (Simon Fraser University)

[168] *Zooarchaeological Potential of Curated Bone Artifacts from Pueblo Bonito, New Mexico*

Most of the unmodified faunal material found during late nineteenth and early twentieth century excavations at Pueblo Bonito, New Mexico, was not curated. However, the Smithsonian Institution and the American Museum of Natural History have extensive collections of animal remains from this important site that fall into two broad groups. Archaeologists collected specimens that had been modified as artifacts, such as awls, scrapers and beads. They also collected unmodified specimens that appeared to be intentionally deposited by the site's inhabitants, such as bird burials, bear paws, and caches of raw material for future artifact production. Curation of these collections has allowed analysis of raw material procurement and artifact production, as well as the potential for future studies using new techniques. Although museum storage has preserved important specimens and associated field records, some earlier curation practices have resulted in a loss of some contextual information. This paper explores the opportunities and difficulties of zooarchaeological analysis of selectively collected specimens.

Drollinger, Harold

[122] *Nuclear Rocketry at the Nevada National Security Site*

Facilities constructed in the 1950s and 1960s for the Rover and Pluto programs at the Nevada National Security Site were used to test and develop nuclear reactors and engines to power rockets for NASA and missiles for the Department of Defense. The goals were to build a nuclear-powered rocket with capabilities for deep space travel and a nuclear ramjet for long-range, low-altitude missiles. Although not fully developed and implemented, both of these scientific endeavors by the national laboratories proved that the technology was feasible. The facilities at the Nevada National Security Site consisted of control and support, assembly and disassembly, and test locations. The assembly and disassembly buildings were connected to the test locations by railroads used to transport test vehicles on modified rail cars. Once the test vehicles were assembled, they were moved to the test locations, and afterwards returned for disassembly and inspection. Today, the facilities are no longer in use as initially intended and are mostly abandoned, and over the last fifteen years have been documented as cultural and historical resources.

[122] *Chair*

Drozdowski, Jarod, Steven Hackenberger (Central Washington University) and Tricia Gabany-Gurrero (California

State University Fullerton)

- [237] *Mapping Power and Aligning Authorities: The La Alberca Ceremonial Complex and the Templo Viejo Site*

The La Alberca Structure Complex includes mound-like structures and related features. These range in date from the Late Archaic through Post-Classic periods. Two buried rock structures are radiocarbon dated to between 4000 and 6500 BP. The alignments of surface features are being compared to the relative geographic positions of volcanic cones and seasonal horizon events including the winter solstice and the Orion constellation. A structure complex at the Templo Viejo Site is also being mapped and this site includes a masonry walled patio or small plaza with outer room blocks dated to the Classic period.

Druc, Isabelle (University of Wisconsin-Madison)

- [19] *Consumers Dictate, Potters Adapt: A View from the Andes*

Investigations are showing that the consumer factor plays an important role in shaping ceramic production, fashion, forms, styles and decoration. What do production scenarios teach us about the relationship with consuming sites? How does this translate when we analyze ceramic pastes and technological styles? Potters keep a delicate balance between their ceramic tradition and adaptive or innovative strategies to produce and distribute their pots. Ethnographic studies help view ancient production and the various data generated by petrographic and chemical analysis a whole different way.

Drummond, Justine (University of Victoria) and Jason De León (University of Michigan)

- [121] *Interactions at Humanitarian Water Drop Sites: An Archaeological and Ethnographic Study of Clandestine Culture Contact among Undocumented Migrants, Humanitarian Aid Groups, and Border Patrol*

For over a decade, Arizona humanitarian groups such as Samaritans and No More Deaths have attempted to help undocumented border crossers by leaving bottles of water along the many trails in the Sonoran Desert that lead from Mexico into the United States. These water drop sites have become the source of much public controversy with some viewing them as either acts of littering or attempts to aid illegal immigration. During the 2012 field season of the Undocumented Migration Project, we conducted an archaeological analysis of multiple water drop sites to better understand site distribution practices, evidence of usage by migrants, modification of bottles by different actors (e.g., humanitarian groups and Border Patrol), and associations with other artifacts and site types. These analyses were combined with ethnographic data collected by Drummond during multiple hikes with members of Tucson Samaritans. In this paper we highlight these data and argue that water drops are unique archaeological sites that illustrate migrant strategies of survival, provide interesting discursive and pictograph insight into how some humanitarian volunteers perceive migrants, and reveal strong evidence of the underlying (often hidden) hostilities that exist between Border Patrol and both migrants and those who attempt to help them.

Du, Andrew [215] see Bobe, Rene

du Preez, Kamalu [5] see Bisulca, Christina

Dubreuil, Laure [83] see Stroulia, Anna

Dudgeon, John [27] see Commendador, Amy

Dudgeon, John (Idaho State University - CAMAS), Monica Tromp (University of Otago), Amy Commendador (Idaho Museum of Natural History) and Rebecca Hazard (Idaho State University)

- [47] *Colonization Histories Revealed through Archaeogenetic Analysis of Prehistoric Rapa Nui Skeletons*

The development of improved techniques for extracting, amplifying and analyzing DNA from prehistoric tissue has provided unprecedented access to phylogenetic data for inferring founder events and colonization histories in archaeological populations. Using mitochondrial DNA data recovered from human skeletons on Rapa Nui ($n = 98$) spanning nearly the entire habitation history of the island (AD 1300 – 1900), we present evidence for situating Rapa Nui colonization history in the Central East Polynesian context. Our research finds that Rapa Nui mtDNA sequences in hypervariable region I and II possess high levels of haplogroup variability across the prehistoric period, and share several haplogroup similarities to recent archaeogenetic research from other Eastern Polynesian contexts. Our mtDNA results are consistent with two primary, alternative hypotheses: 1) colonizing voyages in Central East Polynesia were comprised of greater mitochondrial diversity in founding populations than was previously suspected, or 2) Rapa Nui was contacted multiple times after initial colonization, introducing new mitochondrial variability which was subsequently incorporated in the prehistoric population. We present an overview of methodological strategies to evaluate the empirical manifestations under either hypothesis and provide emerging data which we believe is suggestive of multiple prehistoric voyaging contacts on Rapa Nui.

Duff, Andrew (Washington State University)

- [101] *Identity and History on Chaco's Southern Frontier*

Residents of the southern Cibola region fell at the edge of Chaco's reach during the period of its greatest regional influence in the A.D. 1000s and 1100s, at least using great houses as a measure. This region was also at the interstices of two of the Southwest's classic culture areas—Pueblo and Mogollon. During this period, this formerly sparsely occupied region was settled by people who incorporated elements of Chaco materially in architecture and behaviorally in ritual action, but who also actively retained many trappings of Mogollon material culture. Architecture and the material traces of ritual indicate strong familiarity with Chacoan practice, while obsidian procurement, ceramic manufacture, and components of ritual hearken to Mogollon ancestry. Here, I explore the nature of co-residence within three Chaco-period great house sites and their sustaining communities. I look to manufacturing technologies to establish the presence of two distinct learning frameworks, clay and ceramic chemistry to establish local manufacture, and obsidian chemistry to document regional procurement connections. Finally, I tread lightly into kin and marriage relations that may have facilitated coresidence and suggest components of regional organization, resulting in the forging of localized identity that persisted for two centuries.

Duff, Andrew [175] see Safi, Kristin

Duffy, Christopher [58] see French, Kirk

Duffy, Lisa (University of Florida), Diane Z. Chase (University of Central Florida) and Arlen F. Chase (University of Central Florida)

- [69] *Maize and Stone: A Functional Analysis of the Manos and Metates of Santa Rita Corozal, Belize*

It is generally assumed that the primary function of ancient Maya manos and metates was to process maize; however, analysis of ground stone tools from Santa Rita Corozal, Belize suggests that other economic products also were processed on these implements. The materials being processed can be determined by

studying use-wear patterns on these stones. A reciprocal, back-and-forth grinding motion is the most efficient way to process large amounts of maize. However, non-reciprocal rotary movements are also associated with some ground stone implements. For Santa Rita Corozal, the frequency and distribution of flat and trough metates and two-handed manos are compared to the rotary-motion basin and concave type metates and one-handed manos. Flat is the predominant type and, together with the trough type, as expected these grinding stones make up the majority of metates at the site. Manos are highly fragmented, but the two-handed variety also is more common. However, the presence of two types of non-reciprocal motion metates and the clustering of trough metates in one sector of the site suggest that, in addition to maize, significant non-maize food processing also took place.

Duffy, Paul (University of Toronto), Paul R. Duffy (University of Toronto) and Alice Choyke (Central European University)
[227] *Enchained generations at Polgár-Csószhalom: bead use life through experimental conditions*

The long-term use of objects can imbue them with meaning and value that goes far beyond function and economic importance. In Neolithic Hungary, bone beads were important ornaments given to women and girls as parts of bracelets, headdresses and necklaces. The variable degree of wear on beads interred with the dead suggests that sometimes these ornaments were prepared for the funeral and perhaps came for the most part from ornamental pieces worn by other, older members of the community. An experiment designed to explore variation in bone bead use life began in 2007, when a single individual continuously wore imitation Neolithic beads in a necklace for a period of five years. This study, the first of its kind, was designed to assess how long it takes for use-wear polish to accrue on ornamental bone beads. In this paper, the experimental beads are quantitatively described using high-resolution microscopy and image analysis of use-wear. The same techniques are then used on a sample of bone beads from Late Neolithic mortuary contexts from Hungary to test the hypothesis that some bone beads were in circulation for extended periods of time before ritual deposition while others were newly created specifically for the burial event.

Dugas, Lisa (URS Corporation)

[248] *Bone Beads from the Monongahela Tradition*
Late Prehistoric Monongahela tradition sites in southwestern Pennsylvania typically yield large faunal assemblages containing an array of bone and shell beads and ornaments. This class of artifacts illuminates creative expression and flow of ideas for the people that inhabited Monongahela sites. These decorative artifacts likely have temporally and culturally diagnostic traits symbolizing social identity and social networks. However, bone beads and ornaments have received precious little analysis in the region, until recently. This paper describes analysis of bone and shell beads and ornaments from three Middle Monongahela sites, including the Johnston site (36IN2), the Gnagy 3 site (36SO55), and Locus A of the Jones site (36GR4). Topics concerning material procurement, manufacture, typology, style, and social expression (e.g., social identity) are explored by using a zooarchaeological approach to the analysis.

Dugmore, Andrew [273] see Nelson, Margaret

Duin, Renzo S. [292] see Siegel, Peter

Duke, Daron (Far Western Anthropological Research Group) and Jaynie Hirschi (Hill Air Force Base)
[87] *Haskett Technology in the Great Salt Lake Desert: A First Look at New Finds*

Recent finds on the Old River Bed delta are providing new insights into the nature and distribution of Haskett technology. The Haskett

type is arguably the oldest representative of the Paleoindian Western Stemmed Tradition series of projectile points, with a group of dates on black mat organics at the locality indicating a Younger Dryas time frame between approximately 11,000 and 10,200 14C BP. In this poster, we present images and technological attributes for the collection, including one 22.7-cm showpiece that may be the largest Haskett example yet documented archaeologically.

Duke, Guy (University of Toronto)

[136] *Quotidian Meals and Commensal Rites: Late Moche Culinary Practice in the Jequetepeque Valley, Peru*

Archaeologists are in a unique position to interpret identity and subject formation as mediated by everyday domestic life and larger political economic dependencies through the examination of the material remains of food production and consumption (e.g. cooking/storage vessels, plant/animal remains, and food processing/preparation implements). Everything from status and ethnicity to family and individual identity can be expressed in the preparation, serving, consumption, and disposal of food. This paper will report on the initial findings from my dissertation fieldwork exploring the interconnections between cultural identity, subject formation and culinary practice through food production and consumption in the politically unstable Late Moche Period (A.D. 600-850) in the Jequetepeque Valley of Peru. My research design is geared to shed light on the contextual meanings of culinary practices during these turbulent times in order to elaborate on the ways in which the preparation and consumption of food create and maintain social distinctions.

[136] *Chair*

Dull, Bryan (Indiana University South Bend)

[148] *Intra-Site Debitage Patterns and Trajectories at the Collier Lodge Site (12 PR 36), Porter County, Indiana*

The Collier Lodge site (12 PR 36), located in Porter County, Indiana, along the Kankakee Marsh, is a multi-component site that dates from the early Archaic period to the very recent past. During the 2003-2011 field seasons this site underwent an intensive investigation conducted by the University of Notre Dame in cooperation with the Kankakee Valley Historical Society and Indiana University South Bend. This study analyzes the debitage recovered from the site in order to assess reduction strategies and site use. The debitage was first separated into distinct units by stratifying the assemblage based on provenience, followed by size grading. Within each of these units, the flakes were examined for variations in the maximum length and width, percentage of completeness, percentage of cortex present, number of dorsal scars, and platform morphology in order to determine what relationship these variations in attributes have on each other. Although this research highlights the difficulty in analyzing multi-component sites, this poster also discusses the patterns in site use and trajectories of reduction strategies employed at the Collier Lodge. In this way, the data which contribute to an understanding of debitage patterns will help differentiate cultural behaviors over time.

Dull, Bryan [269] see Myers, Sarah

Dungan, Katherine (University of Arizona)

[43] *Kivas, Plivas, and Plazas: Variation in Religious Space and Religious Practice in the 13th Century Mogollon Highlands*

Anthropological and archaeological models often discuss religion and ritual as being conservative, heavily structured, and governed by rules. In Southwestern archaeology, such structure can be seen in the shared features of religious architecture within regions

through time. Great kivas in the Mogollon Highlands, for example, show some degree of continuity in shape and floor features from the Late Pithouse period well into the Pueblo period. A closer look shows substantial variability among these structures, however, including some which deviate substantially from the idealized plan. Recent excavation by Archaeology Southwest at a Tularosa Phase site in Mule Creek, NM, for example, has uncovered portions of a great kiva-like feature that shows interesting differences from the norm. This variability has the potential to inform a model of religion as both mutable and structured, shedding light on changes in religious practice through time – particularly during the widespread social and demographic shifts of the early Pueblo IV period – and on synchronic variability in religious practice across space.

Dunlop, Alexis [42] see Kelly, Johanna

Dunne, Jennifer [106] see Maschner, Herbert

Dunning, Nicholas (University of Cincinnati), Eric Weaver (University of Cincinnati), Michael Smyth (The Foundation for Americas Research Inc.) and David Ortegón (INAH, Mexico) [144] *Water Control and Ancient Maya Population Dynamics in the Puuc Hills*

The hilly Puuc region of Yucatan and Campeche presented the ancient Maya with severe challenges because of seasonal aridity, lack of surface water, and scarcity of water-bearing caves. Regional settlement history was conditioned by the distribution of natural water sources and the construction of reservoirs and cisterns. The political control of these water sources appears to have limited the mobility of regional population particularly as both social and environmental pressures increased during the Terminal Classic. We use the large site of Xoch as a case study to illustrate these patterns, and then compare it with other sites in the region.

Dupras, Tosha [74] see Wheeler, Sandra

Duwe, Sam (Eastern New Mexico University)

[29] *Space, Place, and Fluid Landscapes of Archaeology in the American Southwest*

The American Southwest contains one of the most intensively studied archaeological records in the world. Spanning the entirety of the 'American tradition' of anthropological research, the history of archaeological fieldwork in the region provides a framework for investigating theoretical, methodological, and political changes in the discipline. This paper explores the spatial history of archaeological research in northern New Mexico (i.e., focus on small/big sites, uplands/lowlands, excavation/survey) to understand how archaeologists' ideas of space and place influence interpretations of the past, and how ideas and forces - both inside and outside of anthropology - influence research priorities.

Dye, Tom [47] see Athens, J.

Dye, Thomas (T. S. Dye & Colleagues)

[255] *Wealth in Old Hawai'i: A Regional Chronology of Leeward Kohala, Hawai'i Island*

"Surplus production" is a blunt concept for the study of social complexity in old Hawai'i. It is argued that a distinction between wealth-assets and consumables, which is ignored by the concept of surplus production, is critical to understanding the course of traditional Hawaiian history. The argument is illustrated with a regional chronology of leeward Kohala, Hawai'i Island. Development of sweet potato gardens in traditional Hawaiian times supported production of large pig herds, which were managed as wealth-assets by a line of ali'i leading to

Kamehameha I. A period of production intensification in the leeward Kohala field system after Cook's visit to the islands in 1778-9 is explained in the context of historically recorded changes in the value of pigs.

Ea, Darith [249] see Ea, Darith

Ea, Darith (APSARA Authority, Cambodia) and Darith Ea (APSARA Authority, Siem Reap, Cambodia) [249] *The Torp Chey Ceramic Kiln Site*

This paper discusses findings from the recent excavation at the Angkorian period Torp Chey kiln site conducted by archaeologists from the Department of Conservation of Monuments Outside Angkor Park, led by Dr. EA Darith. The Torp Chey kiln No. 2 is the largest kiln structure in Southeast Asia to date, measuring 21m in length and 2.8m in width. The Torp Chey kiln is different from other excavated kiln sites in the Angkor area and the excavated Khmer kiln sites in Buriram province, Thailand. The kiln was constructed on an artificial mound of sandstone chips and contains four firing chambers separated by three secondary fire trenches heated by a single fire box. The kiln mound is part of a group of some 12 kiln mounds situated close to a Jayavarman VII rest house and a Suryavarman II temple also named Torp Chey, on the ancient road between the Angkorian sites of Beng Mealea and Bakan. The artifacts excavated from this kiln include large brown-glazed jars, roof tiles, and animal-shaped figurines. In this paper we will discuss some of the unique features of this kiln, as well as the technological development of the kiln structure, and ceramic production at the site.

Eamick, Cheryl (Unisource Energy Corporation)

[152] *Sustainable Preservation through Building Relationships*

Sometimes working within the regulatory framework is not enough to accomplish sustainable preservation of cultural resources. Much can be learned through building relationships, not only with people, but with the historical value of the resources we are trying to protect. Tucson Electric Power (TEP) a subsidiary of Unisource Energy Corporation, approached the Navajo Nation Historic Preservation Department (NNHPD) to obtain clearance allowing them to conduct routine vegetation management for two existing electric transmission lines in Western New Mexico. Although the 330-foot right of way corridor had been previously reviewed for the presence of cultural resources in 1970 and 1980, the field review methods used were found lacking in the identification of Navajo cultural resources because they were conducted long before the Navajo Nation Cultural Resources Protection Act (NNCPA). A field visit to the site with Ron Maldonado of the NNHPD revealed a plethora of unknown resources that were immediately evident by simply stepping outside the field vehicle. Recognizing the need to protect these resources, TEP and NNHPD formed a valuable relationship enabling them to work together to develop a plan that would protect the area's rich cultural history now and into the future.

Earl, Graeme [9] see Cox, Grant

Earl, Graeme (University of Southampton), Graeme Earl (University of Southampton), Angeliki Chrysanthi (University of Southampton) and Tom Frankland (University of Southampton)

[125] *Blending Digital and Physical Fieldwork Research: The RCUK PATINA Project*

The RCUK PATINA project is a three year research project exploring the interaction of digital and physical forms of research practice. Archaeological fieldwork has formed a key component of this. The project has undertaken detailed ethnographies of on-site and lab practice, employed a variety of digital tools to augment the fieldwork process and to encourage collaboration and information exchange, and introduced human computer interaction probes as

a means to stimulate new ideas. Fieldwork contexts discussed in the paper include work at Catalhoyuk in Turkey, Portus and Pompeii in Italy and a range of commercial and research excavations in the UK. The paper will provide an overview of the project and set out key theoretical and practical issues for the future of archaeological field practice.

Earle, Timothy (Northwestern University)

- [133] *Corporate and Network Strategies, Staple and Wealth Finance, and Primary and Secondary Chiefdom-States*

The stress on process, not typology, has help rescue archaeological theory. Specifically, the distinction between corporate and network strategies has proven remarkably good to think with concerning changing political organizations across time and space. This distinction is linked to differences in institutional strategies within political economies. People seize upon ways to structure and finance opportunistically to organize themselves politically. To illustrate, I consider the changing political economies in prehistoric Oceanic chiefdoms and then reconsider primary and secondary state formation, not in terms of primacy, but in terms of contrasting political economies.

Eastman, Emlyn [183] see Wismer-Lanoë, Meredith

Eckerle, William [281] see Neff, Ted

Eckert, Suzanne [267] see Habicht-Mauche, Judith

Eckert, Suzanne (Texas A&M University), David Snow, Kari Schleher (Crow Canyon), Judith Habicht-Mauche (U.C. Santa Cruz) and W. D. James (Texas A&M University)

- [267] *Following the Yellow Brick Road: Yellow Slip Clays and the Production of Rio Grande Glaze Ware in North Central New Mexico*

This provenance study seeks to determine whether locally-available slip clays used by glaze-ware potters at Tunque Pueblo, a late Pueblo IV Period village in north-central New Mexico, also were used by glaze-ware potters at contemporaneous San Marcos Pueblo, some 20 miles distant to the northwest of Tunque. A sample of 85 ceramic sherds, bricks, and clays were analyzed using a combination of experimental firing and laser-ablation inductively-coupled-plasma mass spectrometry (LA-ICP-MS) chemical characterization. Although potters from San Marcos appear to have been using a clay local to Tunque Pueblo to slip their vessels, this clay is not the same clay used by Tunque Pueblo potters to make their pottery. These findings have important implications for prehispanic resource management by residents of Tunque Pueblo.

Edinborough, Kevan (University College London)

- [291] *Boom and Bust in Europe's Early Farming Populations*

We present summed calibrated radiocarbon date distributions from a number of regions across the western half of Europe as a demographic proxy (6,000-2,000 cal B.C.). We develop a new set of statistical tools that allow for the identification of significant features in summed calibrated date distributions, as well as correlations with other temporal processes, whilst dealing with concerns regarding sample sizes and sampling error, taphonomic losses, long term population trends, multiple samples from sites, and potentially unjustified features in the calibration curve. Our results indicate that West European populations grew rapidly in

many regions with the onset of farming, but that these growth rates were not sustained.

The new subsistence system, despite its potential for supporting increased populations in any suitable area, did not bring long-term stability. The characteristic regional pattern indicated by changing population densities is one of instability; of boom and bust. We demonstrate the existence and quantify the scale of these instabilities and discuss the possibility that they have endogenous or exogenous causes.

- [131] *Discussant*

Edmiston, Kelly [73] see Younie, Ashlee

Edwards, Susan (Desert Research Institute)

- [122] *BREN Tower: The Rise and Fall of an Atomic-Age Icon*

For 50 years the 1,500 ft high BREN (Bare Reactor Experiment, Nevada) Tower dominated the surrounding desert landscape of the Nevada National Security Site (formerly the Nevada Test Site). Associated with nuclear research and atmospheric testing programs carried out during the 1950s and 1960s, the tower was a vital component in a series of experiments aimed at characterizing radiation fields from nuclear detonations. Research programs conducted at the tower provided the data for the baseline dosimetry studies crucial to determining the radiation dose rates received by the atomic bomb survivors of Hiroshima and Nagasaki, Japan.

Recently, this monumental structure was torn down. Desert Research Institute archaeologists completed Historic American Engineering Record (HAER) documentation of BREN Tower before its demolition. Research focused on developing a comprehensive historic context for the tower and all its associated structures. This included an extensive search for historic written and photographic records of the tower as well as the original engineering drawings used in its design and construction. Video interviews with two of the principal scientists responsible for the BREN research programs added a unique perspective to the context. This poster summarizes the results of the HAER documentation of this once imposing symbol of atomic-age.

Edwards, Gillian

- [207] *Trans-Holocene Moisture Change in Northern Baja California: The Woodrat Assemblage from Abrigo de los Escorpiones*

Baja California has been called "the Forgotten Peninsula" due to the lack of environmental and archaeological studies conducted in this region despite Baja's unique ecology. Abrigo de los Escorpiones is a Late Quaternary archaeological and paleontological site located in Northern Baja California off the coast of the Pacific Ocean. It has great potential for paleoenvironmental reconstruction because it has a large, well-stratified, small mammal assemblage spanning the terminal Pleistocene to Late Holocene. The large woodrat (*Neotoma*) assemblage at this site is particularly amenable to paleoenvironmental reconstruction because it consists of two woodrat species, *N. lepida* and *macrotis*, that have distinct habitat preferences that reflect moisture availability. I analyze the relative abundances of these two species using a Woodrat Index in order to track moisture change throughout the Holocene. Species-level identifications are based on morphology due to my finding that mandibular or cranial measurements do not adequately differentiate these two species. This data can illuminate differences and similarities between Baja's unique ecology and the ecology of other areas, such as greater Western North America. These differences are particularly relevant to questions regarding the global impact of climatic events such as the Monsoon cycles

and the Medieval Climate Anomaly.

Edwards, Richard (UW-Milwaukee)

- [263] *Wisconsin Oneota Faunal Exploitation: A Case Study from the Crescent Bay Hunt Club (47JE904), Lake Koshkonong, Southeastern Wisconsin*

Despite regional studies on the topic (e.g., Gibbon 1972; Hunter 2002; Overstreet 1995, 1997), the nature of Oneota subsistence strategies in eastern Wisconsin remains unclear. Early studies indicated that deer and elk were the primary component of an upland hunting focus. More recent studies noted the large numbers of fish remains and suggest that a lowland focus on fishing was a more important aspect of the diet at Oneota sites. These studies focus on different sites, primarily Carcajou Point and Crescent Bay Hunt Club, and utilize differing criteria to estimate dietary importance. Therefore, it is difficult to assess the relative dietary importance of mammals or fish. A sample of the faunal remains from the Crescent Bay Hunt Club, a 13th through 14th Century Oneota habitation site in Jefferson County, Wisconsin are examined in an attempt to begin clarifying the focus of subsistence strategies during the Oneota occupation of the Lake Koshkonong region.

Eeckhout, Peter

- [259] *The Coastal Icon: A Reappraisal of Middle Horizon to Late Periods Ikonography on the Central and North-Central Coast of Peru*

Religious imagery of Late Middle Horizon (800-1000 A.D.) at Pachacamac (Central Coast of Peru) illustrates North-Central Coast themes with some Wari influence in stylistic details. The main divinity that appears in textiles from the site as well as the wooden Idol has the same attributes and cultural associations as Casma/Supe's Sky God (Menzel 1977) and is also very similar to its primitive version in the Teatino style (Villacorta and Tosso 2000). As its characteristics recur all over the coast from Lurín to Casma (at least), I propose to call it the Coastal Icon.

Eerkens, Jelmer [71] see Green, Shannon

Eerkens, Jelmer (University of California, Davis) and Eric Bartelink (California State University, Chico)

- [177] *A Stable Isotope Perspective on Violence among Central Californian Hunter-Gatherers*
- Bioarchaeological data, such as embedded projectile points and craniofacial trauma, are often used to estimate levels or rates of interpersonal violence in the human past. One inherent limitation is identifying whether traumatized individuals are local or nonlocal members of a society. In this study, we use strontium, oxygen, carbon, and nitrogen stable isotopes in an attempt determine group membership of individuals with evidence of interpersonal violence. We draw on several archaeological case studies from Central California to show the value of the stable isotope approach in creating a context for violence.

Ehrich, Richard (UCLA Cotsen Institute of Archaeology)

- [216] *The Sanxingdui Hoards: Representatives of a Systematic Deposition Practice?*

The two extremely large bronze hoards that made Sanxingdui famous are striking examples of a remarkable way that certain types of early metal artifacts were treated in Sichuan: they were ritually deposited. However, were these two so-called "sacrificial pits" unique occurrences set apart from other depositions in the area by their sheer enormity? Or do they represent an established custom of deposition, which could tell us more about the role that early bronze artifacts played in Sichuan?

In order to find an answer to these questions, in this paper I shall take a close look at the two hoards of Sanxingdui, concentrating less on what artifacts they contained, but more on how, when, and

where these artifacts were buried, drawing conclusions also on the reasons for their deposition. I will also make comparisons with known deposition practices of the Bronze Age in China and elsewhere. In this way I hope to clarify how the new material of bronze was received in Sichuan and what values were attached to it.

Eichner, Katrina (UC Berkeley)

- [99] *Repacking the Risqué: Public Response to the Archaeology of Sexuality*

This paper will investigate how archaeological research which focuses on a risqué or culturally heated topic can be made accessible for a hesitant public. Using the site of Fort Davis, Texas as a case study, the author looks into how research concerning historic prostitution and women's health at a nineteenth century military fort has been accepted by a conservative, rural community. Concerns such as locating sites, securing permits and funding, and keeping interpretations accessible for family consumption will be addressed. Oral histories from the community evidence both individual distancing for a seedy past and a popular acceptance, and in some cases pride, for a well-known part of the town's history. Despite these conflicting sentiments, an accessible archaeology can be practiced which both meets community needs and expectations while still allowing for archaeologists to research questions which are commonly avoided due to their stigmatized nature.

Einck, Andrea

- [268] *Petrographic Analysis of Historic Brownwares at a Nineteenth-Century Military Fort: Results and Implications*

In this poster, I will analyze the historic Brownware ceramics collected from Fort Selden, New Mexico (1865-1891), using petrographic analysis to determine the ceramics' specific temper types and possible source area(s). The analysis will provide further information on local pottery production-distribution networks and allow for comparison with northern New Mexican and Texan/Mexican historic Brownware manufacture methods. My project provides additional information about the effects and influence of the American military on the Southwestern frontier. My results reveal new dimensions of ethnic and social interactions between the mestizo Hispanic community and Fort Selden's military inhabitants.

Einhorn, Jessica (Australian National University)

- [51] *A Reinterpretation of Rock Art in California through a Look at Traditional Californian Basket Imagery*

In Australia, images found in prehistoric rock art also occur in sand drawings, acrylic paintings, bark paintings, on baskets, and other forms of contemporary art. Aboriginal Australians still remember the symbolic meaning and context of these images. Using the concept of connections between images in multiple forms of art in Australia as an interpretive methodology: do images in prehistoric rock art in California also occur in traditional basketry made today in California? This paper seeks connections between images found in rock art and contemporary traditional basketry in central California. Using the links between rock art and traditional basketry in Northern Australia as a guide, I explore how the interpretation of meaning of images found in traditional basketry allows California archaeologists a better understanding of images found on rock?

Eiring, Melissa [182] see Tomka, Marybeth

Ek, Jerald (SUNY Albany)

- [140] *Reconsidering the Mesoamerican Urban Tradition: Maya Cities from the Classic to Postclassic*

Although 25 have passed since Sanders and Webster published their seminal and controversial paper defining "The Mesoamerican Urban Tradition," there has been relatively little progress in understanding common features or variability among cities in the pre-Hispanic era. However, research in the past five years has begun to address central questions about urbanism in ancient preindustrial state societies drawing on concepts from comparative urban theory, which provides a framework to understand the role of cities within the political, economic, social, and ecological systems in which they were embedded. This paper focuses on changes in urbanism in the Maya Area between the Classic and Postclassic Periods, drawing on comparative case studies from other parts of Mesoamerica. Although there is continuity in some basic characteristics that define a broad Mesoamerican tradition, the Classic to Postclassic transition witnessed a fundamental change in Maya urbanism and human-environmental interaction. This transition included the end of a centuries-long experiment with low-density agrarian-based urbanism and a transition to a more nucleated urban tradition in the Postclassic period.

Eldridge, Kelly (University of California Davis)

- [130] *Zooarchaeological Investigations of the Antiquity of Iñupiat Socioterritories on the Seward Peninsula*

Ethnographers have posited that Iñupiat socioterritories in Alaska were established hundreds if not thousands of years ago. In order to test this hypothesis, eighteen published Western Thule archaeofaunal assemblages were compared to historic, territory-specific subsistence patterns on the Seward Peninsula. Fourteen of the Western Thule assemblages proved to be viable for regional analysis, including the recently analyzed Snake River Sandspit site in Nome, Alaska. In general, results indicate that regional subsistence economies associated with socioterritorial boundaries on the Seward Peninsula have changed little since Western Thule occupation.

Eldridge, Morley (Millennia Research Ltd.)

- [156] *Tablet Computers in an Excavation*

Tablet computers are inexpensive, easily obtained, have sufficiently large displays to be useable, and have reasonable on-board cameras and microphones, and can be linked to other devices such as bar code readers. This means that it is viable for several tablets to share in standard record keeping and note recording for an entire excavation. Paper notes may become redundant to the point that they are not necessary, since redundancy for data safety and quality control can be built-in to tablet-based recording. This paper describes how tablet computers, bar code readers, bar-code linked cameras, and bar-code reading robotic total stations worked together to create a completely paperless, highly efficient excavation and recording system that uses real-world coordinates as the basic organizational principal.

- [156] *Chair*

Eldridge, Roger (Millennia Research Ltd.)

- [156] *Use of Barcodes in Field Survey and Laboratory*

Pre-printed, project specific barcodes proved to be beneficial in streamlining and processing archaeological data from the field to the laboratory. The field system incorporated the use of barcodes and scanners, gps and data collectors, digital photos, and minimal written notes. A system of redundancy and backup in the field methodology ensured the information to solve problems was available. The time required to track down problems resulting from in-field labeling errors was substantially reduced compared to earlier field seasons that did not use bar codes. Field labeling time was also reduced and simplified and the barcodes allowed instant look-up functions in the laboratory. The project took place in northern British Columbia on large glacial lake beds that have

been re-exposed by reservoir operations. Field conditions are often extreme with rapidly changing weather, major dust events, heavy rain, and at times, snow. The barcodes proved "bullet-proof". Nearly 1000 artifacts were collected in the 2012 field work and over 7000 artifacts have been recorded in past field seasons.

Ellenberger, Katharine (Binghamton University)

- [287] *Chaco "Culture" and the Kin Klizhin "Community": Estimating Human Relationships in Southwest Archaeology*

At Chacoan Outlier Kin Klizhin and surrounding sites, the ubiquity and continuity of visibility in the built environment points to this being an important principle for residents. In my previous research, visibility relationships at Kin Klizhin suggested that visibility was materialized as both an expression of Ancestral Puebloan ideas and as a technique of community constitution. This begs the question: what does the word 'community' mean when it is used to describe the complex of material signatures we call Chaco Culture? And how do what seem to be meaningful, smaller 'communities' relate to it? In this presentation I will discuss different levels of 'community' as they are used by Chacoan scholars, and how we might understand the layered nature of identities which are collapsed in the concept of 'community'.

Ellick, Carol (Archaeological and Cultural Education Consultants)

- [257] *Beyond the Classroom: Transitioning from Student to Career*

As academics, we prepare students to enter the field swaddled in theory; which is terrific for intellectual discussions, but somewhat lacking in the practicalities of pursuing a career. Many students graduate with a B.A. or M.A. in anthropology, completing a carefully planned academic curriculum, but receive little in the way of practical applied skills and no idea where to look for work or how to apply for jobs. While not universal, many anthropology programs rely on university career centers and on students seeking their own assistance. To aid in the transition, some departments have instituted "Capstone" classes. During the Fall 2006 semester at the University of New Mexico, a new course, "Avenues to Professionalism," was presented to graduate students and upper division undergrads. Upon completion, students walked away with a job application-ready portfolio and the knowledge, skills, and abilities to successfully transition from student to a career. Their universal recommendation was that every anthropology student should take the course. Our response was the development of the book, "The Anthropology Graduate's Guide: From Student to a Career." This presentation will explore the course content, book design, and make recommendations for better preparing students for a career that utilizes their anthropology degree.

- [141] *Chair*

Elson, Mark (Desert Archaeology), Michael Ort (Northern Arizona University) and Kirk Anderson (Museum of Northern Arizona)

- [131] *A Tale of Two Volcanoes: Human Response to Eruptions in the Southwest U.S.*

Ethnographic and archaeological data document that volcanic eruptions can act upon social groups as catalysts, as processes, and sometimes as terminating factors. Tephra deposition can alter natural and cultural landscapes, requiring significant, sometimes permanent, behavioral change for group survival. Two cinder-cone volcanoes – Sunset Crater and Little Springs – situated in northern Arizona ~200 km apart, erupted within the span of at most 100 years and possibly a single generation. Both areas were inhabited by small groups of dry-land farmers with similar social complexity, but adaptation to the eruptions differed markedly. Sunset Crater produced a widespread cinder blanket and elicited significant post-eruptive social, demographic, and technological change, including large-scale migration. Volcano refugees left the Sunset Crater

area and settled in the arid lower elevations where the tephra blanket served as moisture-conserving mulch allowing increased crop production. These groups soon constructed some of the largest and most complex sites in the region. The Little Springs eruption, which produced no cinder blanket, also caused migration and settlement restructuring, but instead of large-scale abandonment, small settlements continued much as before and the lava flows became a defensive refuge. These successful adaptations provide lessons that may be applicable to modern hazards research and management.

Elson, Christina [178] see Minc, Leah

Elspeth, Ready [96] see Morin, Eugene

Emberling, Geoff (Kelsey Museum)

[56] *Altered States: Settlement Networks in the Kingdom of Kush*

From its beginnings in the early 20th century, archaeology in Nubia (southern Egypt/northern Sudan) has been defined by survey, much of it done as salvage work associated with dam construction at Aswan and elsewhere. Despite the relative abundance of data on site location, size, and date, there has been relatively little analysis of the patterns and networks of settlement in this region. Yet there are numerous reasons the Nubian case is an important one for comparative studies of early states. It clearly differs significantly from its contemporaries (and neighbors) in Egypt and the Middle East in being less strongly urbanized, yet territorially extensive. Do these differences relate to economic systems, social structures, or the nature of political authority in the region? Do they inform arguments about varieties of states, like segmentary states, secondary states, or African states?

A focused analysis of a particularly high quality regional survey—that conducted by Derek Welsby and colleagues in the North Dongola region—allows an assessment of these issues for the so-called “kingdom of Kush,” ca. 2500-1500 BC. Like much of Henry Wright’s work, this reanalysis has the potential to bring a new case of state formation into comparative anthropology.

[30] *Discussant*

[30] *Chair*

Emerson, Thomas (Illinois State Archaeological Survey)

[24] *Ethnogenesis and Political Formation on Cahokia’s Northern Frontier*

Investigations at Cahokia and its hinterland have increasingly refined our archaeological knowledge of its political, religious, and social emergence as the first proto-urban center in native North America. These new insights indicate that traditional models portraying Cahokia’s relationship with a static hinterland as unidirectional no longer capture the fluid and dynamic nature of the late prehistoric midcontinent. This discussion demonstrates that coincidental with the rise of Cahokia was the creation of a new dynamic interaction in its northern frontier that led to the coalescence of new political and ethnic formations, as well as a dramatic shift in subsistence patterns. Late Woodland populations reacted differently leading in some areas to the emergence of petty chiefdoms, and, in others, to more loosely organized tribal groups. Despite the diversity of political formations, the entire northern frontier rapidly adopted full-time maize agriculture. These late prehistoric shifts interestingly followed earlier Late Woodland ceramic and material culture divisions suggesting that such boundaries have a social reality that many archaeologists have been reluctant to accept. The dynamics sparked by Cahokia on its northern frontier transform the midcontinent and have impacts that long outlast the rise and fall of that center.

Emerson, Patricia (Minnesota Historical Society)

[94]

Documenting Jeffers

The rock carvings at Jeffers have been the subject of numerous documentation efforts over the past 124 years. Antiquarians, avocationalsists and professional archaeologists have produced a plethora of records in a widely divergent set of media - pencil tracings, pen & ink sketches, rubbings executed with black paint on muslin, 35mm photography in both black & white and color, 8mm movie film, individual peck marks recorded on Mylar with felt-tip pens, and, most recently, digital photography and white light scanning. This paper will explore how these varying sets of documentation reflect, first, the assumptions and idiosyncrasies of individual researchers, and second, evolving understandings of the nature, extent and significance of the carvings. Finally, it will address how the history of documentary efforts at Jeffers mirrors the history of changing attitudes and standards in the study of rock art in North America.

Emerson, Thomas [124] see Wisseman, Sarah

Emery, Eric (National Transportation Safety Board)

[193] *The Role of Forensic Archaeology in the Development of Guidelines and Best Practices in Mass Disaster Scene Mapping and Recovery*

Mass disaster scenes can be broadly categorized as having resulted from natural phenomena, accidents, or criminal activities. The recovery contexts that result from these events are complex, presenting co-mingled biological remains, personal effects, and other probative evidence that can be distributed over areas ranging from meters to kilometers. Regardless of the type of disaster encountered, victim identification begins with a systematic recovery of the scene, in a manner that best preserves the overall integrity of its spatial and temporal context. Today, the standardized archaeological methods and techniques that are used in disaster response to ensure maximum search coverage and survey completeness, to conduct precision scene mapping, and to collect, visualize, and analyze spatial data are being codified almost exclusively by forensic anthropologists with extensive training and experience in field archaeology. The development and application of comprehensive protocols and best practices in disaster scene recovery are presented and discussed.

Emery, Kitty (FL Museum of Natural History)

[228] *Animal Sacrifices in the Ancient Maya World*

The sacrifices of animals as part of many different rituals are described in Maya art and literature from the earliest to most recent times. Such sacrifices appear to have been part of domestic and sacred rituals at both private and public levels. However, verified zooarchaeological evidence of animal sacrifices is rare either because such sacrifices were less common than we think, or because we are not well able to find or interpret evidence of them. In this paper I explore Maya zooarchaeological data and Maya art and literature to better understand the material markers of animal sacrifice at Maya archaeological sites.

Emmitt, Josh (University of Auckland)

[129] *Investigating Ceramics from the Neolithic Occupation of Kom W, Fayum, Egypt*

Previous investigations have suggested that the Neolithic occupation of Kom W, Fayum, Egypt represents everything from a temporary encampment to a village. Here I report on a study of ceramics from museum and field contexts from Kom W. Sherds identified in the field can be analyzed on site or collected for further analysis in a field laboratory. I make use of the entire ceramic assemblage, regardless of position or state of preservation. Focusing on vessel form, supplemented by some material analysis, I intend to estimate the number of vessels represented by sherds based on geometric data from complete vessels from the same assemblage. Complete vessels were recovered during Caton-Thompson and Gardner's investigations in

the early twentieth century. Preliminary results of this study suggest some vessels were used for storage on Kom W, which has implications for the nature of occupation of the Fayum during the Neolithic.

Enloe, James (University of Iowa), Theodore Marks (University of Iowa) and Grant McCall (Tulane University)

[11] *Stratified MSA and LSA in the Namib: Preliminary results from Erb Tanks*
 Erb Tanks Rockshelter is a Middle and Later Stone Age (MSA and LSA) site located in the Central Namib Desert of Namibia. With occupations dated from 130 kya B.P., Erb Tanks is the only stratified site from the Central Namib to be successfully dated to the Middle Stone Age. Here we report results from 2011 and 2012 excavations at Erb Tanks. Over two field seasons, we have expanded on previous work done at the site and increased our sample of artifacts to nearly 13,000, including over 3,700 artifacts mapped in situ. In addition to previous Amino Acid Racemization dating, we have successfully obtained five Optically Stimulated Luminescence dates from upper layers which appear to show occupation of the site near the time of the Last Glacial Maximum (LGM) and human occupation of the Namib around a time of peak aridity. While analysis of all recovered artifacts is incomplete, our results tentatively point to the possibility of continuity between the MSA and LSA in Southwestern Africa. Therefore, Erb Tanks raises questions for models that argue for regional depopulation and cultural discontinuity between the MSA and LSA.

[11] *Chair*

Enote, Jim [110] see Breunig, Robert

Epstein, Emily (University of Wisconsin -Milwaukee)

[227] *Games, Exchange, and Stone: Hunter-Gatherer Beads at Home*
 Beads recovered from Mortar Riddle, a Late Archaic village in the Great Basin, are useful for furthering our understanding of hunter-gatherer daily life and how prehistoric social networks linked small groups to larger communities. Beads fashioned from subsistence taxa requiring group acquisition represent a socially coordinated event as well as nutritional value. A bone game piece that was also worn as a pendant suggests an individual could transport a small group activity to many households, potentially connecting communities. Beads manufactured from species that naturally inhabit distant ecosystems or from material acquired from distant sources suggest evidence for long distance networks, linking households to regions. Most beads were small and recovery was possible only with use of 1/8" mesh. Some beads required ultrasonic cleaning and microscopy for material identification. This research concerns beads fashioned from bone, shell, and stone from a household perspective. The Mortar Riddle site beads, identified in various stages of manufacture, clearly were not just for show.

[151] *Chair*

Erb-Satullo, Nathaniel (Harvard University), Brian Gilmour (Oxford University) and Nana Khakhutaishvili (Shota Rustaveli State University)

[226] *Transitional or Traditional? Technological Choice in Copper Production at the Cusp of the Iron Age in the Southern Caucasus*
 The end of the Bronze Age and the beginning of the Iron Age is an area of intense research in the Eastern Mediterranean and Western Asia. Numerous hypotheses exist for the technological development and spread of iron production. Some see iron production as emerging from copper and bronze technology, while others see bronze and iron production as occurring in very different social and economic configurations. Nevertheless, direct investigation of these hypotheses is limited, with most research focusing on the Cyprus and the Levant.

New investigations of a vast complex of smelting sites along the southeastern coast of the Black Sea, mostly dating to the Late Bronze Age and Early Iron Age, offer an exceptional chance to understand how metallurgical technology changed over this crucial period. Both copper and iron ores exist in abundance in the region, and earlier work suggests that both iron and copper smelting may have occurred there. By studying the choices metal smelters made as well as the relative spatial organization of production, this research tests existing hypotheses about the Late Bronze to Early Iron Age transition, and generates insights about the spatial and ultimately social dimensions of technological innovation and spread.

Erdogu , Burçin [263] see Atici, Levent

Eren, Metin I. [148] see Gurtov, Alia

Erlandson, Jon [70] see Willis, Lauren

Erlandson, Jon (University of Oregon)

[167] *On the Marginality of Islands*

Underlying discussions of the human colonization of islands in many parts of the world are remnants of a theoretical hangover associated with the idea that island and coastal ecosystems were generally of lower productivity than their terrestrial counterparts, and thus marginal for foraging and agricultural peoples. Islands come in many shapes and sizes, however, with varying constraints on human settlement and sustainability. Since the end of the last glacial, moreover, the size and productivity of most islands have been reduced significantly by sea level rise and coastal erosion, affecting modern perceptions of their relatively limited resource diversity and productivity. Anthropogenic impacts to island ecosystems, in both historical and more ancient times, have further accentuated the apparent marginality of many islands. Here, using Sardinia and California as case studies, I argue that some islands were probably optimal habitats for maritime peoples and were settled relatively early in human history.

[283] *Discussant*

Erlingsson, Christen (Linnaeus University, Kalmar, Sweden)

[72] *Archaeology and Nursing: Strange Bedfellows with a Common Aim*

This presentation's aim is to describe advantages of collaborative projects between nursing and archaeology in efforts to increase life quality for the Third Age. In sync with the emerging trend of an aging population there is an urgent interest to understand health of older persons. While nursing adopts an individual/family perspective, it's inescapable not to be affected by governmental measures to protect the social-economic stability in society from the pressure of overuse of healthcare e.g., by older persons and family caregivers. From a nursing perspective the older person needs engagement, continuity, and reciprocal relationships to experience health. Research also indicates that beliefs about one's situation and experiences of reciprocity have great impact on health and well-being. In the Nursing Department at Linnaeus University, relationships based on engagement and reciprocity, and models to explore belief systems are established areas of education and research. In turn, the Archaeology Department, with its significant knowledge base, can enrich older persons' lives by supporting experiences of connection and reconnection through providing opportunities for "history made personal." Cultural heritage interventions dovetail nicely with efforts to support health through emphasizing continuity and historical roots. These two strange bedfellows, nursing and archeology seem surprisingly suited to collaboration.

Escoria, Lilia (Instituto de Investigaciones Antropológicas, UNAM), Linda R. Manzanilla (Instituto de Investigaciones Antropológicas, UNAM) and Fabio Barba (Escuela Nacional de Artes Plásticas, UNAM)

[17] *Faces of Teotihuacan Ethnicity. Facial Approximation of Five Skulls of the Classic Period*

The relevance of the Teotihuacan metropolis in the Classic Period of Central Mexico is that of being a multiethnic settlement due to the migration of people from different regions of Mesoamerica. This is reflected not only in the morphoscopic characteristics of the crania, and thus their physical appearance, but also in culturally modified biological traits, such as cranio-cephalic deformation. In this paper, the facial graphic representation of five Prehispanic skulls, corresponding to individuals working in the Teopancazco neighborhood center of Teotihuacan during the Classic period, is presented, through the fisionomic trait composition derived from the "La Cara del Mexicano" ("The Face of the Mexican", Serrano et al. 2001) data base, in frontal view, as well as an artistic representation of the profile, following the norms of the sculptural procedure.

Esdale, Julie [88] see Yeske, Kate

Esdale, Julie (Colorado State University, CEMML)

[90] *Tool Stone Procurement and Lithic Assemblage Variability in the North*

Archaeological assemblages are shaped by a number of cultural and practical factors. In this paper, tool stone availability is explored as a primary agent of differences among Alaskan lithic assemblages. Raw material source locations are compared to lithic assemblage characteristics from four middle-Holocene age archaeological sites located in the western Brooks Range and the Tanana River Valley. Bedrock strata containing three main types of raw materials commonly found in archaeological sites (chert, basalt, and obsidian) were mapped in GIS using data assembled from USGS geology maps. These maps were used to identify minimum site distances to tool stone sources. Assemblage characteristics that provide clues to economizing behaviors (hafting methods, evidence of resharpening, stage of discarded tools, debitage density, and frequency of initial core reduction debitage) were compared among the excavated sites. This study found that site residents exploited local lithic resources whenever possible but long-distance trade or transport occurred even in lithic-rich areas. Non-local materials were heavily curated in all sites. Areas closer to tool stone resources had denser assemblages, more discarded tools, and less evidence of economizing behavior. Occupants in lithic-poor areas may have relied much more heavily on organic materials for tools.

[90] *Chair*

Esh, Kelley, Andrew Pietruszka (JPAC CIL) and Penny Minturn (JPAC CIL)

[251] *Defining Forensic Archaeology at JPAC CIL*

JPAC undertakes the excavation of aircraft crash sites and ground losses in the attempt to recover the remains of U.S. military personnel from all past conflicts. Due to the nature of these sites, excavations are typically large-scale, fast-paced, and often involve as many as one hundred local workers supporting an American team of ten to fifteen personnel. Given the sheer volume of excavation and the methods used during JPAC recovery operations (i.e. heavy machinery, large grid unit size), our work is sometimes referred to as "salvage archaeology" or "applied archaeology". This paper will argue that these terms are not the most appropriate labels for the archaeology conducted at JPAC CIL. Rather, our recovery efforts fall squarely within the developing field of forensic archaeology.

Espinosa, Yolanda [290] see Domínguez, María del

Esteban, Irene [172] see Albert, Rosa

Estes, Mark (WCRM, Inc.), Geoffrey Cunnar (WCRM, Inc.), Jay L. Johnson (WCRM, Inc.) and Edward J. Stoner (WCRM, Inc.)

[148] *A Prehistoric Knapping Station from the Fire Creek Archaeological District, Lander County, Nevada*

Archaeologists in the Great Basin rarely find intact cultural deposits on surface contexts due to various post-depositional processes that can often scatter artifacts across a large area. In 2010, a potential single flint knapping episode was identified within the Fire Creek Archaeological District, Lander County, Nevada. In this location, a dense surface concentration of the local toolstone (dacite) was recorded apparently originating from a flat rock and large core nearby. This flake concentration was collected in 20 cm² units following the methods outlined by Kvamme (1997). In this experimental research, Kvamme statistically modeled flake distribution patterns associated with various knapping postures, such as standing, kneeling, squatting, and sitting. We evaluated the Fire Creek concentration considering Kvamme's results, our own cow trampling experiment conducted several hundred meters away from the knapping station, and the potential for movement by slopewash. Our results correlate very closely with Kvamme's experimental data and suggest the flake concentration and core represents a knapping station minimally affected by post-depositional processes. These data indicate that highly intact surface deposits of cultural material can be identified in the archaeological record, even within areas heavily disturbed by both recent grazing and prehistoric animal use of the Fire Creek watershed.

Etcheson, Meeks [142] see Trubitt, Mary Beth

Etnier, Michael (Applied Osteology), Paul W. Collins (Santa Barbara Museum of Natural History), Seth D. Newsome (Department of Zoology and Physiology, University o), Sarah K. Brown (Center for Veterinary Genetics, University of Cali) and Melinda G. Conners (Long Marine Laboratory, University of California,)

[88] *Historical Ecology of Albatrosses in the North Pacific*

Albatross bones are commonly recovered from archaeological sites along the entire margin of the North Pacific rim. Although there are some issues with distinguishing the three North Pacific species, the majority of the bones are from short-tailed albatross (*Phoebastria albatrus*, hereafter, STAL), regardless of the location of the site. Today, STAL breed only on isolated islands in the far western Pacific and forage primarily over the continental shelf/slope waters. If the same were true in the past, how do they come to be such a common component of archaeofaunas, especially those in the eastern North Pacific? Here, we present pilot chemical and genetic data for albatross bones from modern (20th C.) samples and archaeological samples from the Kuril Islands (Russia), and the Aleutian Islands and California (USA) to address two main questions: 1) Did STAL spend more time foraging in near-shore environments in the past and 2) Were STAL breeding colonies more widely distributed in the past. Preliminary isotope data indicate that STAL from the Kurils are significantly different from STAL from Japanese archaeological sites—locations separated by only 900 km. aDNA will be used to characterize population structure and evaluate the second hypothesis regarding breeding colonies outside of Japan.

Etre, Kathryn (Michael C Carlos Museum - Emory University)

[253] *Panama Purple: Investigating a Misunderstood Technique*

A unique purple slip exists on pottery of Panama from approximately 500-1200 AD. Gettens identifies the slip as a red

hematite in the 1942 excavation report of Cito Conte but there is no explanation for the purple hue of the hematite, a color not achieved through the use of hematite alone. No further studies into the production of this purple slip appear to have been conducted and only implausible conclusions for composition of the purple slip offered. Continuing Gettens' work, this research investigates the composition of the purple slip, using complementary analytical techniques: Polarized Light Microscopy (PLM), X-ray Diffraction (XRD), X-ray Florescence (XRF), Scanning Electron Microscopy (SEM), and Fourier Transform Infrared Spectroscopy (FTIR). Several compounds were test fired at different temperatures in attempt to reproduce this unique slip as well as to determine firing conditions. This paper will present the findings to date.

Eusebio, Michelle (University of Florida), Jasminda Ceron (University of the Philippines), Stephen Acabado (University of Guam) and John Krigbaum (University of Florida)

[154] *Rice Pots or Not? Exploring Ancient Ifugao Foodways through Organic Residue Analysis and Archaeobotany*

The recent excavation of the Old Kiyyangan Village in Ifugao, Philippines has recovered a number of cooking pots alongside evidence for plant remains. This presents an opportunity to explore the foodways of the precolonial Ifugao through organic residue and archaeobotanical analyses. Results of pottery residue and plant remain analyses are here integrated to build confidence for the identification of rice and other potential food items in their processed and/or cooked stage. This study also corroborates ethnohistoric accounts that the Ifugao, similar to the Kalinga, had separate cooking pots for rice. By exploring the foodways of the Old Kiyyangan Village using these methods, we hope to contribute to the larger discussion concerning past social organization and the human-environment relationship of the Ifugao people. This paper contributes to the development of these robust methods in archaeological science as they pertain to research problems in Southeast Asia, specifically with respect to precolonial Ifugao archaeology.

[154] *Chair*

Evans, Thomas (Montana State University)

[79] *Elongate Bone Orientation Caused by Fluvial Action: Bone Azimuths and Polarities Do Not Correlate with Flow Direction*

Fluvial transport or reorientation of archaeological skeletal material is typically inferred by measuring the long axis orientations of elongate bones, plotting the orientations on a rose diagram, and inferring a current direction (or lack thereof) based on preferred orientations observed. This method assumes there is a concrete and identifiable correlation between bone orientations and current direction. To test this assumption, ~1800 modern bones were seeded in two rivers (Big Beef Creek, WA; and East Fork Sevier River, UT), 3080 bone casts were seeded in three rivers (Big Beef Creek, WA; East Fork Sevier River, UT; and Levelock Creek, AK), and 13 rivers were searched for bones naturally occurring in them. Two hundred-twelve seeded bones and 871 bone casts have been recovered, and 474 naturally occurring bones and bone fragments have been located. No correlation existed between bone long axis orientation and current direction, and no consistent polarity was exhibited by limb bones. The lack of consistent orientations relative to flow direction was also observed in bone cast orientations. Lack of correlation between flow direction and elongate bone orientation suggests this method of identifying fluvially transported and deposited remains is invalid, the method should be discontinued, and a new method developed.

Evans, Adrian (University of Bradford)

[98] *3D Microscopy in Archaeology: A Review of Techniques and Applications*

3D visualization is a growing field and microscopy has not been exempt from this. An increasing number of microscopy techniques

that produce 3D datasets and visualization are being developed and are being applied to archaeological materials. These range from digital zoom microscopes which can image entire small objects, to Atomic Force Microscopy, which provides resolutions below nanoscale. As an analytical field it is important to understand if 3D data produced by varying systems is purely for visualization or capable for quantitative measurement and description. This paper reviews the range of microscope techniques on the market and provides a critique of their specifications and capabilities. Examples of archaeological applications are also discussed including laser scanning confocal microscopy, focus variation microscopy, and white-light interferometry.

[98] *Chair*

Evans, Adrian [98] see Stemp, William

Evans, Victoria (New Mexico Highlands University, Las Vegas, New Mexico) and Warren Lail (New Mexico Highlands University, Las Vegas, New Me)

[267] *The Representation of Plants in Hohokam Pottery Design*

The Representation of Plants in Hohokam Pottery Design

Evans, Victoria R.1, and Lail, Warren K. 2

The Hohokam, a pre-Columbian people of the Sonoran Desert, turned out a myriad of intricately designed ceramics, many with repeating geometric elements. The meaning or significance of these elements, together with the overall design layouts of which they are a part, have both intrigued and baffled researchers since the early days of Arizona archaeology. The Hohokam were known to depict many aspects of their natural environment including animals, insects, birds and people. However, aside from vessels shaped like gourds or pumpkins and possibly datura seedpods, clear representations of plants are rare, most of which are obvious flower designs. Other designs have been designated simply as "geometric elements." We examined a number of the geometric elements and then compared ceramics from five site/site areas with actual plants that were important to Hohokam subsistence. We conclude that rather than being a rarity, plant designs are relatively common on Hohokam ceramics, and that the designs likely played an important role in the iconography of these early desert farmers.

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Everett, Mark [92] see De Smet, Timothy

Evershed, Richard P. [9] see Pitter, Sharmini

Ewing, Diana (UNLV)

[88] *Use of Baleen by Thule-period Inhabitants of Cape Espenberg, Alaska*

The purpose of my poster presentation is to describe and analyze the found baleen objects from the Cape Espenberg Project in 2010 and 2011. Through the description of knot types, sled shoe, modification similarities, and possible/common uses for baleen a profile of the exploitation of baleen as a resource in Cape Espenberg can be inferred. I also plan to include a description of baleen properties that facilitate use especially in Arctic conditions. The modification of the baleen excavated and any similarities in size and shape may indicate deliberate preparation for specific use. Mapping may be used to discern possible work areas or areas of better baleen preservation within the excavation site. The attempt to DNA type samples of the baleen to particular species

will also be discussed. This may help to determine which species of whale were exploited definitively versus anecdotally.

Ewington, Gabrielle (The University of Sydney)

[104] *Middle Period Cambodian Inscriptions*

In the reconstruction of Cambodian Middle Period history from the sixteenth to eighteenth centuries, written documents, although patently flawed, have been privileged over the archaeological data of the carved inscriptions. The beginning of this period is conventionally seen as a time of rupture, marked by the abandonment of Angkor and the establishment of other capitals in the Phnom Penh area, while the events of this time are largely influenced by references to "the obscurity of centuries without inscriptions and without monuments". Middle Period inscriptions have been somewhat overlooked as they rarely bear the names of rulers or refer to economic or political history. For the most part they are authored by non-royal officials, clergy and pious devotees seeking salvation. Also of relevance are the inscriptions in foreign scripts at Angkor attesting to the continued use of Angkor Wat and other sites in and around the former Khmer capital as places of Buddhist pilgrimage. What has been neglected is the archaeology of where they are found, how many there are in different locations, and how the spatial pattern of Angkor and its hinterland compares to the lower Tonle Sap region.

Ezzo, Joseph (IPLC)

[192] *Discussant*

Fábregas Valcarce, Ramón [196] see Rodriguez-Rellan, Carlos

Fadem, Cynthia (Earlham College)

[178] *Mineralogical Summary from the Early Farming in Dalmatia Project: Soils, Rocks, and Ceramics*

Ongoing work at the Danilo Bitinj and Pokrovnik sites in Central Dalmatia has focused on the mineralogy and geochemistry of site materials. These studies confirm the aberrant nature of the soil parent material, the source of the sites' long-lived arability, and the similarity between site soils and ceramics. Local bedrock is composed entirely of calcite. Surface soils of both site valleys exhibit a relatively even mixture of calcite and quartz. Subsoil from the Pokrovnik site is entirely calcite-free, containing quartz, muscovite, and often montmorillonite. This gross difference in mineralogy indicates a foreign origin for the soil parent materials that supports a much greater fertility than the native bedrock and explains the sites' long agricultural use-life. Valley contexts flooded in foreign materials that promote plant yield are likely locations for other Neolithic settlements throughout the region. The large assemblage of ceramics from these sites contains three material types, each exhibiting strong physical, chemical, and mineralogical similarities to site soils and subsoils. Experimental ceramics may further support the close relationship between Central Dalmatian Early and Middle Neolithic site contexts and ceramic raw materials.

Fahu, Chen [179] see Guanghui, Dong

Fahy, Geraldine E. (Max Planck Institute for Evolutionary Anthropology), Michael P. Richards (Max Planck Institute for Evolutionary Anthropology), Jean-Jacques Hublin (Max Planck Institute for Evolutionary Anthropology) and Christophe Boesch (Max Planck Institute for Evolutionary Anthropology)

[38] *Weaning in Chimpanzees: Stable Carbon and Nitrogen Isotope Analysis to Determine the Duration of Breast Milk Consumption and the Introduction of Solid Foods in Chimpanzees (Pan Troglodytes)*

The process of weaning encapsulates a gradual decrease in breast milk and an increase in solid food consumption. The length of lactation and the onset of weaning are drastically different in most modern human societies compared to that of our closest living relatives, chimpanzees (*Pan troglodytes*). When and why the shift from long, multi-year lactation with gradual weaning seen in Pan to the short duration of lactation observed in most modern human societies occurred is an ongoing debate. We used stable isotope analysis and behavioral observations to investigate the duration of lactation and the onset of weaning in a habituated chimpanzee population in Tai National Park, Côte d'Ivoire. Consumption of breast milk is known to increase consumer δ¹³C and δ¹⁵N values relative to average dietary protein. Our results provide quantitative data on the age and pattern of weaning in wild chimpanzees (*Pan troglodytes verus*) and can assist in the interpretation of weaning habits and associated factors such as infant development and female reproductive success in our early hominin ancestors.

Fairbairn, Andrew (The University of Queensland), Emma Jenkins (The University of Bournemouth), Douglas Baird (The University of Liverpool) and Geraldine Jacobsen (Australian Nuclear Science and Technology Organisation)

[3] *Plant Gathering at the Ninth Millennium Cal B.C. Settlement at Pınarbaşı A and D on the Konya Plain, Central Anatolia*

Central Anatolia was one of the first areas to develop agriculture following its origins in the Fertile Crescent of southwest Asia, yet little is currently understood about the chronology, processes and trajectory of that transition. By the early 8th millennium cal B.C. crops were being used at Aşıklı Höyük, with Çatalhöyük East evidencing crops as a key economic resource by the end of that millennium. Macrofossil and microfossil analysis of Pınarbaşı A and D in the southern area of the Konya Plain, supported by a focused AMS dating program, indicates the presence of a plant gathering economy through the 9th and into the early 8th millennium cal B.C., complementing the hunting of wild animals. Wild almonds and terebinth were utilized yet there is convincing evidence for neither seed exploitation nor the use of either domestic crops or their ancestors. This strategy is similar to the Late Pleistocene settlements of Oküzini and Karain, yet differs from the seed-focused contemporary economies of the Fertile Crescent. Analysis supports the presence of a sedentarizing community of hunter-gatherers in Konya Plain contemporary with crop using settlements to the east at Aşıklı Höyük, indicating a differential and prolonged uptake of crops by settlements in the region.

[3] *Chair*

Fairley, Helen (US Geological Survey), Brian Collins (US Geological Survey), Amy Draut (US Geological Survey), Skye Corbett (US Geological Survey) and David Bedford (US Geological Survey)

[125] *Evaluating the Effects of Glen Canyon Dam on Downstream Archaeological Sites in Glen and Grand Canyons, Arizona*

The role of Glen Canyon Dam operations in affecting the physical condition and rates of erosion at downstream archaeological sites in Glen and Grand Canyons has been a subject of debate for more than 20 years. Although decades of research demonstrate that Glen Canyon Dam has altered the geomorphological and ecological conditions of the Colorado River corridor, the effects of the dam on archaeological sites is still poorly understood. In order to determine the effects, if any, that dam-related physical and ecological changes have had on archaeological site condition, a team of USGS scientists has implemented a multi-pronged research and monitoring project involving high-resolution monitoring of local weather and sediment-supply conditions, repeat measurements of site topography using terrestrial and airborne lidar, mapping of surficial sedimentary deposits, and modeling of potential and actual erosion scenarios. This program is unprecedented in the study of regulated rivers and the effects of dams on archaeological sites. Preliminary results show that

erosion of archaeological sites is ongoing, driven largely by rainfall run-off events; initial results also indicate that dam operations have affected the ability of the sedimentary system to rebound from these erosional events over time, thereby contributing to the degradation of some sites.

Falls, Eva, Kimberly Pyszka (College of Charleston) and Maureen Hays (College of Charleston)

[119] *An Archaeological Exploration into the 19th Century Fickling Plantation Slave Settlement, Hollywood, S.C.*

In 1807, Joseph Purcell surveyed the property known today as the College of Charleston's Center for Environmental Research, located approximately 15 miles west of downtown Charleston, South Carolina. The plat indicates the plantation belonged to Joseph Fickling and, as typical of many 19th century plantations, it included a main house at the end of an avenue of oaks with a nearby slave settlement. Today, the avenue of oaks is the only visible reminder of the Fickling plantation. As with many former plantations in the South, little is known about the enslaved peoples who once lived and worked on the Fickling plantation. This poster will present findings from our research on the slave settlement of this property. Through archaeological testing we have pinpointed the location of the slave settlement. The recovered material objects and documentary evidence, such as census records and runaway slave advertisements, aid in telling the history of the Fickling family's enslaved people who once lived in the settlement, as well as the changing plantation landscape of early-19th century South Carolina.

Falvey, Lauren W. [101] see Baustian, Kathryn

Falvey, Lauren (Desert Research Institute/UNLV)

[122] *Before Nuclear Testing: Historic Archaeology on the Nevada National Security Site*

The Nevada National Security Site (NNSS), formerly the Nevada Test Site, holds a rich history of human activity prior to the advent of nuclear testing. Both Euroamerican and Native American groups occupied the area in the late 19th and early 20th centuries. The first presence of Euroamerican settlers in the area consisted of pioneers and prospectors who emigrated west across Nevada during the California Gold Rush of 1849. This led to the development of small-scale mining and ranching operations in the region during the late 1800s, including short-lived mining districts at locations such as Wahmonie and Oak Springs. It was near Oak Springs that the Western-genre novelist B. M. Bower and her family lived during the 1920s. At the same time, Western Shoshone and Southern Paiute groups continued to utilize some of their winter residential campsites in the area. While historic habitation and industrial use of this land lasted less than a century, the materials left behind are persistent features of the landscape. This poster explores the archaeological remains left behind by the Euroamerican and Native American occupants of the NNSN from the mid-19th century to 1940.

Fan, Xuechun [66] see Jiao, Tianlong

Fang, Hui (Centre for East Asia Archaeology, Shandong University) and Bo Yang

[164] *Cultural Heritage Education in China*

Education about cultural heritage in China can be traced back to the time of Confucius around 2,500 years ago, when leaders of different states built temples for offering sacrifices to royal ancestors and for displaying treasured antiquities. The Palace Museum in Beijing represents continuation of the principle of caring for official collections. I identify and discuss three periods of cultural heritage education in China. The first period (1911 to 1949) was devoted to establishing the sovereignty of cultural relics

and education about cultural relics at the local level. The second period (1949 to 2000) was guided by historical materialism and involved numerous archaeological discoveries, publication of many text books for high school and university students, and exhibitions in museums at the local, provincial, and national levels. The third period, continuing into the present century, involves transformation of the concept of "cultural relics" to "cultural heritage." This process includes a new emphasis on applications for World Cultural Heritage recognition and university courses about "double heritage"—tangible and intangible cultural heritage. Cultural heritage education is a significant trend and a rapidly developing field in China.

Faniel, Ixchel [247] see Yakel, Elizabeth

Farahani, Alan [149] see Ames, Nicholas

Farahani, Alan (University of California, Berkeley)

[201] *Beyond Subsistence: Agricultural Production and Imperial Intervention at Dhiban, Jordan, 1000 B.C.E.–1400 C.E.*

New archaeobotanical data from three seasons of excavation at Tall Dhiban in west-central Jordan offer compelling evidence of changing agricultural strategies concomitant with shifting political interventions during the Levantine Iron Age, Classical, and Middle Islamic periods. Dhiban is located to the east of the Dead Sea between two deep wadi escarpments in a precipitation zone at the edge of reliable rain-fed agriculture. Nevertheless, macrobotanical remains of free-threshing wheat varieties with high water requirements are found throughout the site's two thousand year occupation despite these environmental challenges, pointing to enduring traditions of complex water-management and crop choice. Differences in the relative abundance of crops, however, such as grapes in Classical period contexts and barley in Middle Islamic, illustrate dynamic community agricultural responses to evolving imperial economic prerogatives. In contrast, the cross-period continuity of domesticates such as legumes underscores the negotiations of these communities with the exigencies of non-local economic demands and local agro-ecosystemic needs. Complementary morphometric analyses of domesticate seeds alongside quantification of agricultural weed diversity within and across each of these periods reveal the changes to and the maintenance of the agricultural practices that sustained communities during these critical periods of Levantine history.

Fargher, Lane (CINVESTAV del IPN)

[133] *Bureaucratization in Pre-Modern States: A Historical and Cross-Cultural Study of Strategies and Philosophies*

Anthropological theory on premodern or ancient states often assumes a priori that bureaucracies were an essential part of centralized and oppressive political structures. As a result little effort has been expended in understanding how and why costly, both in terms of human resources and revenues, administrative structures were constructed. Accordingly, the role of bureaucratization in political processes remains poorly operationalized in anthropological archaeology, which in turn puts limits on our understanding of the history of state formation in many world areas. In this paper, I use cross-cultural and historical information on bureaucratization to illuminate the transition from more decentralized and segmentary structures to more centralized and collective formations in the Valley of Oaxaca during the Terminal Formative to Early Classic transition and in China from the Northern and Southern Dynasties to the Tang Dynasty. The results of this analysis demonstrate that bureaucratization is a key strategy for building collective states that protect taxpayers' (peasants') rights and that control the agency of regional and local lords. A finding inconsistent with traditional anthropological theory that emphasizes oppression and domination of peasants by

governing elites.

[133] *Chair*

Fargher, Lane [140] see Levine, Marc

Farley, Gina [185] see Moore, Summer

Farnsworth, Kenneth [124] see Wiseman, Sarah

Fash, William (Harvard University)

[64] *Reflections on the Grasshopper Legacy in Ancient Maya Archaeology*

Numerous archaeologists who went on to distinguished careers in the archaeology of the ancient Maya owe much to their training at Grasshopper. The regional approach to ecology, settlement, and landscape; the intellectual traction provided by long-term engagements with sites and communities; the productivity of household archaeology; the vital importance and immense rewards of training new generations of archaeologists; the usefulness of employing competing perspectives and paradigms daily in the research; and the value of collegiality have all been manifested in archaeological research programs directed by Grasshopper veterans in Mexico, Guatemala, Belize and Honduras. Some examples of these approaches and their practitioners' contributions will be discussed, including some highlights of the long-term research and teaching programs conducted in the Copan Valley, Honduras.

Faulkner, Patrick [68] see Harris, Matthew

Fauman-Fichman, Ruth (University of Pittsburgh)

[231] *Small Site Obsidian Provisioning in the Tlaxcala Block*

A small multi-component site not recorded in Garcia Cook's surveys in the 1970's was recently added to the archaeological register in Tlaxcala. Surface survey indicates settlement from the Middle Formative through the Postclassic periods. The site shows surface evidence indicating household use and reuse of obsidian in varying levels of intensity, but no obsidian workshop activity. Pxr analysis of surface and limited test pit material reveals eight obsidian sources, with over half of the obsidian coming from the Paredon obsidian source. The variety of obsidian sources, together with functional analysis, stimulates hypotheses about procurement strategies that changed with the political circumstances of different time periods.

Fauvelle, Mikael (University of California, San Diego)

[256] *Diachronic Change in Maya Diet and Status: New Perspectives from the Eastern Maya Lowlands*

Work in the Eastern Maya Lowlands over the past several decades has produced a large volume of isotopic values from ancient Maya burials.

Among other things, such data allows us to investigate ancient Maya diet, but has generally been applied only to a single site or time period, and is rarely compared across social status. In this paper, we present the results of a meta-analysis of Belizean isotopic data in order to arrive at a diachronic understanding of the relationship between ancient Maya diet and status. We conduct our analysis using two new isotopic modeling techniques; a simple carbon isotope model and a multivariate isotope model. We show that while elite diets vary considerably both through time and space, commoner diets are characterized by remarkable resiliency in the Early, Late, and Terminal Classic. This could suggest that elite subsistence strategies were more closely tied to political and economic circumstances than those employed by commoners.

Our results highlight the applicability of isotopic analysis to questions dealing with diachronic change and social status.

[256] *Chair*

Fayek, Mostafa [252] see Roberts, Heidi

Fazzari, Adam [135] see Barone, Pier Matteo

Feathers, James [147] see Hauser, Neil

Feathers, James (University of Washington)

[183] *Luminescence Dating of Adobe in Coastal Peru*

The north coast of Peru has an abundance of prehistoric adobe structures, some very large, ranging in general age at least from the Initial Period through the Inca period. Many of the structures are not well dated. Luminescence dating is applied using feldspars to several adobe structures, including the early and later architectural phases at Huaca del Sol and Huaca de la Luna in the Moche Valley, where the chronological relationship between the two remains uncertain. Because adobe is not heated, luminescence is dating the last exposure of the adobe bricks to light. The degree of bleaching is discussed, along with issues of precision.

Fedje, Daryl [137] see Orchard, Trevor

Fehrenbach, Shawn

[123] *Realizing the Digital Revolution: A Comprehensive Digital Approach to Data Collection, Management, and Reporting on the Navajo-Gallup Water Supply Project*

This paper explores the technical capabilities and benefits of a fully digital workflow developed and implemented by PaleoWest Archaeology on the Navajo-Gallup Water Supply Project (NGWSP). Flexible, innovative approaches to networking devices in the field provide the platform for secure and reliable digital data collection in harsh environments. Developments in hardware, particularly in tablet computing and smartphone technologies since the latter half of the 2000s, have produced devices that are especially well-suited for a broad range of archaeological recording tasks. An expansive relational database houses data generated by the project. This database is leveraged through a custom application, which provides an intuitive and user-friendly interface for data collection, management, and analysis that can be used by field archaeologists, laboratory analysts, and principal investigators alike. Benefits of the process include the elimination of digitization, elimination of redundant data entry, reduction of error, improved data security and QA/QC processes, and streamlined reporting through automatic generation of forms, tables, and report sections. These benefits are amplified by the size and duration of the NGWSP.

[123] *Chair*

Fehrenbach, Shawn [206] see Roberts, Theodore

Fehren-Schmitz, Lars

[260] *Paleogenetic Analysis of Human Remains from a Nineteenth-Century Cemetery in Connecticut, USA*

Here I report on the paleogenetic analysis of four skeletons excavated at the Yale New Haven Hospital in summer 2011. Main concern of the investigations was to identify the individuals, validate morphological sex determinations, and test for kinship. Furthermore, information regarding the population genetic

ancestry of the individuals should be obtained to help contextualizing the burials with historical processes of 19th century New Haven. To address the formulated questions we analyzed the full range of mitochondrial and nuclear genetic markers common for forensic casework, employing assays specifically designed for the analysis of heavily degraded DNA. Additionally, Single Nucleotide Polymorphisms informative for the phenotypes (hair- and eye color) of the individuals were typed. For three individuals it was possible to reproducibly obtain all genetic data for ancestry analysis. The comparison to available genetic databases revealed that all individuals are of European ancestry and allows narrowing down the possible geographic origin. Even though the individuals seem to be closely related genetically for none of them a direct kinship could be determined.

Feinman, Gary [106] see Golitko, Mark

Feinman, Gary and Linda Nicholas (The Field Museum)

[133] *Framing the Rise and Variability of Past Complex Societies*

To paraphrase Bruce Trigger, the study of past complex societies and their developments has long been characterized by a conceptual tussle between efforts at generalization and the unraveling of specific cases. While each historical case is in certain senses unique, there are both scientific and policy rationales for drawing broader implications regarding this increasingly rich body of cross-cultural and often diachronic data on the varying pasts of human societies. This presentation critically focuses on the variety of overarching frames that have been traditionally employed by archaeologists to account for the seemingly analogical features in these episodes of social change. Given the diversity of historical paths that have been taken, it is argued that these approaches have focused too concordently on uniformities and unilinealities that are hard to see. Drawing conceptual links beyond archaeology, directions toward a comparative theoretical frame that endeavors to account for variability in ancient states is offered.

Feldman, Marcus (Marcus Feldman)

[212] *Cultural Niche Construction and Its Consequences*

Cultural Niche Construction occurs when some aspects of an organism's behavior affect the transmission, reception, and evolution of other aspects of that organism's (or another's) behavior. I focus on mating propensities, son preference, and fertility choices as examples, and show how these cultural niches may influence genotypic relationships among individuals and populations.

Fenn, Thomas (Katholieke Universiteit Leuven)

[93] *Invention or Innovation? Pyrotechnological Connections between Metallurgy, Glass, and Glazes*

Distinctions between the concepts of "invention" and "innovation" are often confusing and ambiguous. Rarely, if ever, is invention the result of a lightning-strike "aha" moment. Rather invention tends to be the application of clever innovation from one aspect of life to another, shaped through personal observations and/or experiences. The "invention" of metallurgy, for example, did not simply spring from the earth one morning, but rather evolved from observations of and experiences in other pyrotechnological processes. Past scholars have speculated on the invention of various early pyrotechnological activities, such as glassmaking and glaze production. What has not been fully explored, however, are the aspects of invention and innovation linking these and other pyrotechnologies. An example of this is the paucity of research emphasizing the innovative technological connections between ancient non-ferrous metallurgy (e.g., copper, gold, silver), and the advent of and developments in glass and glaze technologies. In

this paper these connections will be explored from pyrotechnological and craft technique perspectives. Ideas concerning "inventions" and "innovations" of glass and glazes in connection with non-ferrous metallurgy will be discussed. I will argue that rather than invention, creation of these vitreous materials resulted from clever innovations influenced by metallurgical processes and materials.

Fennell, Christopher (University of Illinois)

[115] *Transatlantic Entanglements and Cultural Transformations*

This presentation applies theories concerning the role of individual creativity and innovation, modes of symbolic expression, and formation of social group identities to analyze the past creation and use of material expressions of symbols within the diasporas of particular African cultures. Utilizing archaeological and historical evidence, I explore the divergent ways these creative processes played out at sites in South America, the Caribbean, and North America. In addition to insights available from documentary and oral history records, the material expressions of key cultural elements offer significant indicators of individual creativity and the incremental developments of new social group identities. As researchers, we experience a great privilege in uncovering, explicating, and honoring these material traces of creativity and perseverance by individuals who confronted formidable adversities.

Fenner, Jack [7] see Bulbeck, David

Fenoglio, Fiorella [63] see Saint-Charles Zetina, Juan Carlos

Fenoglio, Fiorella (Fiorella Fenoglio), Enah Fonseca (Instituto Nacional de Antropología e Historia) and Israel Lara

[91] *Protección del Patrimonio Arqueológico ¿Debemos Incluir a la Sociedad Civil?*

Una de las tareas fundamentales de un arqueólogo debe ser generar estrategias que nos permitan proteger el patrimonio cultural arqueológico. Sin embargo, día, nuestra experiencia en el dentro del Instituto Nacional de Antropología e Historia nos hace suponer que aún queda mucho por hacer. Día con día vemos cómo importantes fragmentos de historia prehispánica son destruidos sin que podamos llegar a tiempo para recuperar el contexto y la información en él contenida. Creemos, por tanto, que las estrategias empleadas hasta el momento han sido insuficientes para evitar y prevenir la destrucción de los contextos. El trabajo que hemos desarrollado hasta el momento nos ha permitido identificar que uno de los factores que inciden en la destrucción es la desvinculación de nuestro trabajo con la sociedad civil. Por ello, consideramos importante evaluar la relación de nuestro quehacer, sus objetivos y estrategias con los que deberían ser nuestros principales receptores: la sociedad civil. Por ello, en esta ponencia presentaremos algunos ejemplos de cómo – vinculando a la sociedad civil con el patrimonio cultural - logramos obtener aliados en su protección.

Fenoglio Limón, Fiorella [91] see Lara Barajas, Israel

Ferguson, T. J. [67] see Hopkins, Maren

Ferguson, T.J. (University of Arizona)

[67] *Chair*

Ferguson, Leland (University of South Carolina)

[271] *"Flocked Together on the Street": The Archaeology of an African-American Place in*

Moravian Salem, North Carolina

In 1766, Moravians founded Salem in southeastern North America as an *Ortsgemeine*, or settlement town, not a mission. Over time, however, the Brethren used their North Carolina town as a base for a mission among the distant Cherokee Indians. Locally they gradually embraced racial slavery and segregation, and the Female Mission Society responded by establishing a mission for African-Americans in Salem—located on the periphery and lowest part of the town. Over time, the mission church, and especially the associated graveyard and environs, became the center of a widely dispersed Moravian and non-Moravian African-American community. Archaeological investigations have recovered lost details of the intentionally obliterated graveyard leading to a new understanding of how Pietism, accepted and rejected, affected social structure and agency in the oppressed minority. This research played a part in a preservation program encouraging racial reconciliation in the 21st century.

Ferguson, Jeffrey (University of Missouri)

- [279] *Japanese Obsidian: Past Use, Current Research, and Future Studies*

As one of the most volcanically-active areas of the world, it is no surprise that Japan has a number of high-quality obsidian sources, and these sources have been exploited by humans for tool production for tens of thousands of years. The northern island of Hokkaido alone has at least 23 chemically distinct sources, and the rest of the region includes at least 50 sources. In this paper we address the geologic origins for much of the volcanic activity; describe previous and on-going efforts to identify, sample, and characterize the obsidian outcrops; examine archaeological evidence for the use, trade, and exchange of these obsidians; and discuss the potential for obsidian movement between Japan and surrounding regions.

- [279] *Chair*

Fernandez, Maya (University of Michigan) and Jason De Leon (University of Michigan)

- [121] *Documenting the Dead: A Geo-Spatial Analysis of Published Migrant Death Locations*

Since 2000, over 2300 bodies of undocumented migrants have been found in the Sonoran Desert of Southern Arizona and Northern Sonora, Mexico. Most scholars agree that this death count grossly underestimates the actual number of people who have died trying to cross the desert. Many bodies go unrecovered because they are located in inaccessible areas or because corpses have been destroyed by environmental processes. Currently, the public data that does exist regarding known fatalities is incomplete. In many cases, the cause and locations of these deaths are not known or are listed with incomplete or incorrect information. In this poster I present a GIS analysis of published geo-spatial data on migrant death drawn from public media outlets, governmental reports, and other sources from 2000 to 2012 to better understand what these data can tell us about cause of death and its connection to seasonality, geographic conditions, and distance from the border. A predictive model is also presented that could potentially assist with identifying areas with a high likelihood of unrecovered bodies. Finally, I discuss the limitations of the currently available spatial data and discuss the ethics of using GIS to understand and locate migrant death sites.

Maya Fernandez

Fernandez, Esteban (University of Colorado, Boulder)

- [202] *Beyond the Gleam: A Multidisciplinary Study of Aztec Metallurgy*

Though highly advanced and of remarkable sociopolitical and symbolic importance, Mesoamerican metallurgy continues to be an understudied field. While recently there have been a number of advances in the identification of metal extraction sites and archaeometric techniques by which archaeologists can make inferences about manufacture processes, these advances

continue to leave many gaps in the *chaîne opératoire* of metal artifacts throughout Mesoamerica. Most neglected of all are gold artifacts, which due to curatorial issues along with a relative lack of extant materials have been largely inaccessible. This paper presents the results of a multidisciplinary study in which experimental archaeology was combined with ethnohistoric and archaeological evidence in order to recreate and compare the efficiency of some of the techniques that were available for Mesoamerican goldsmiths to fabricate a number of gold sheets used as tributary payments to the Aztec empire. Along with assessing which of these fabrication techniques was most probably used, this study will also attempt to identify ways in which they may be found in the archaeological record in order to paint a full picture of the production process of gold artifacts in Mesoamerica.

Fernández, María José [168] see Scheinsohn, Vivian

Fernandez Souza, Lilia (Universidad Autónoma de Yucatán), Mario Zimmermann (Universidad Autónoma de Yucatán) and Joaquín Venegas de la Torre (Universidad Autónoma de Yucatán)

- [113] *Revisiting Patio-Galleries: Use of Spaces in Structure 2D6 of Chichén Itzá*

Patio-gallery structures have been a topic of discussion almost from the beginnings of research in Chichén Itzá. They have been suggested as markets, residential structures, as private or public buildings, as well as compared with similar constructions in other Mesoamerican sites. In this paper, we offer a discussion about the possible function of the gallery of Structure 2D6, a patio-gallery structure located at the center of the site. We use architecture, features, and chemical analysis to suggest what kind of activities could have been performed in the different areas of the structure at different moments of occupation and compare the results with similar cases both at Chichen Itza and other sites.

Fernstrom, Katharine (Towson University)

- [263] *Genetic Identification of Aquatic Shell: A Proposed Program of Experiments for Archaeological Application*

Source identification of shell requires prior taxonomic identification, which currently is accomplished by using landmarks on intact shells. Recent success, in Germany, in identifying Margaritifera margaritifera using shell-based DNA opens possibilities for archaeological identification of shell fragments. A thorough review of factors which preserve or destroy this DNA is necessary for understanding the limits of this potential new source of data. I propose a program of experiments focused on the effect of artifact deposition and site formation processes on shell-based DNA.

Ferrara, Carlotta [135] see Barone, Pier Matteo

Ferraris, Pietro [105] see Tringham, Ruth

Ferris, Neal (University of Western Ontario)

- [24] *On Becoming within and beyond Archaeological Borderlands*

Implicit in conventional framings of archaeological tradition is that there are temporal and spatial limits, beyond which begins the next material manifestation. Assuming we can perceive this transition archaeologically, perhaps similarity and difference here reflects more than boundary, materially also encompassing local perceptions of the world within and without. Indeed, these spaces can be physical and conceptual borderlands: material, spatial, and mental landscapes of residence, tradition, and transition where engagement with heightened internal and external social forces allowed the world to be known differently. Moreover these would have been fluid places, perceptions and processes - places of

becoming something other - at the intersection of tradition and contingency. One such transitional borderland existed in the lower Great Lakes in North America through the Late Woodland (A.D. 1000-1400). Archaeological data for several past communities in this borderland reflect hybridity and a continually revising settlement, subsistence, and material tradition. This data also suggests the borderland was temporally mobile, shifting in place and time as community change either materially maintained tradition, or transformed descendants beyond the borderland and onto the other side of that boundary. The implications of this data for understanding borderlands as places of becoming are considered here.

[24] *Chair*

Fetterman, Jerry

[152] *Discussant*

Fiehn, Oliver [124] see Tushingham, Shannon

Field, Julie [27] see Commendador, Amy

Field, Julie (Ohio State University)

[195] *Fijian "House" and "Household": Ethnographic Recollections and Implications for Residential Archaeology*

Early ethnographic accounts of Fijian houses and households focus predominantly on the residences of chiefs, or on village residences set aside for special guests. The descriptions of these residences, their construction, their location, and the activities within and around them, have also been refocused through a lens of Christian religious tradition, which emphasizes the conduct of particular activities by men and women. In many instances these accounts bypass the residences of the rest of the community, and describe community structure in only general or unflattering terms. Archaeological investigation of houses offers an opportunity to engage the static historic descriptions, and provide a view of households and communities over the long term. The research presented here examines depictions of houses in the Sigatoka Valley, Fiji, which were described in the late 19th century, and archaeologically investigated in the early 21st.

[195] *Chair*

Fierer-Donaldson, Molly

[61] *Funerary Ritual and the Identification of "Royal" Burials among the Classic Maya: A View From Copan, Honduras*

Funerary rituals are created by communities, but it is individuals who die, even when they are interred together. This makes burial contexts a place where the worldview of a community meets the identity of individuals. Death is the one event experienced by everyone that also leaves an archaeological record. In a state society, where the creation and maintenance of social difference and social stratification are necessary for its continuance, the universality of death and the different ways in which it is commemorated can give important insights into how a community views itself. For over 100 years archaeologists have excavated Classic Maya burials, but it was Estella Krejci and Patrick Culbert (1995) who first systematically tried to identify patterns of variables that would allow us to recognize royalty and other population subsets by comparing hundreds of burials from multiple cities. This paper takes up those questions again by looking at the Classic Maya city of Copan, Honduras not included in the original study. Over 1000 burials have been excavated at Copan and why five are currently considered to be royal is essential to understanding both the role burial ritual plays in Classic Maya society and the worldview it reflects.

Figueroa, Antonia [78] see Levi, Laura

Figuls, Alfons [147] see Weller, Olivier

Filimoehala, Christopher and David Addison (American Samoa Community College)

[27] *Examining the Late Settlement of Tokelau*

Tokelau, a small archipelago consisting of three coral atolls 500 km north of Samoa, is often overlooked in discussions of Polynesian colonization and expansion. Nevertheless, some scholars have suggested that it may have played a role as a stepping stone into East Polynesia and the rest of the northern atoll arc. Recent work in Tokelau indicates that colonization may not have occurred until after East Polynesian expansion and settlement of the Phoenix and Line islands. This paper discusses how and why Tokelau may have remained unsettled during periods when other islands were colonized and how it relates to broader questions of colonization in the region.

Filini, Agapi (El Colegio de Michoacan)

[63] *Teotihuacan and West Mexico: Ritual Exchange and Systemic Interdependence*

The Teotihuacan exchange system was highly asymmetrical characterized by a varied set of relations with other sites in culturally distinct areas of Mesoamerica. Although there are radically different views in the literature regarding the processes of transmission of ideas, the flow of goods, and the materialization of information in West Mexico, the identification of a number of variables in terms of ritual economy allows for the understanding of the responses of local actors. This paper addresses the information transmission processes that took place between Teotihuacan and West Mexico by means of the identification of the artifacts exchanged and the factors that may have accounted for their circulation, as well as their impact on local political economies.

Fillios, Melanie (The University of Sydney)

[20] *Companion or Competitor? Exploring the Dingo-Human Relationship from an Archaeological and Ecological Perspective*

The dingo has frequently been viewed as a hunting companion, camp dog, and even as an occasional meal in lean times. However, its role as a competitor with humans for the same food resources has received little attention. This paper explores the impact of the dingo on human prey choice in Holocene Australia, and tests the hypothesis that dingoes and humans may have been competitors – and not just companions. Using a multidisciplinary approach, this issue is explored by drawing on ecology, anthropology and experimental archaeology. Specifically, this study examines the way in which this competition could have shaped human prey choice by examining how the introduction of a novel predator may have influenced the vulnerable native fauna of Australia's closed ecosystem. The implications of this influence are then extended to human hunting practices, and subsequently tested by the zooarchaeological record. The ecological and anthropogenic implications of this hypothesis are then viewed against the dramatic changes seen in the archaeological record of Holocene Australia.

Finney, Bruce [26] see Misarti, Nicole

Finney, Suzanne (Bureau of Arts and Culture/Palau Historic Preservation Office, Republic of Palau) and Sylvia Kloulubak (Bureau of Arts and Culture/Palau Historic Preservation)

[244] *Contextualizing the Historic Landscape in the*

Republic of Palau

Recent survey work by the Bureau of Arts and Culture/Palau Historic Preservation Office (BAC/HPO) in three states on Babeldaob, the largest island of Palau, indicates that there is still a lot of tangible material left behind by the occupation of Japan in the 20th century. In particular, the vast remnants of both Japanese civilian and military life in Palau between the 1920s and 1940s can be found in abandoned properties: homesteads, farmsteads, road systems and defensive features (caves, tunnels, refugee camps) that were left, often intact, at the end of World War II, and continue to be untouched and largely forgotten to the present.

To describe these sites and features within the context of an encompassing historic landscape might be considered a practical interpretation, but this interpretation is not compatible with the larger and more significant concepts within Palauan cultural and traditional heritage, a heritage spanning thousands of years and which contain both the tangible and the intangible in ways that the material remains of Japanese occupation do not. This paper discusses the results of fieldwork conducted in 2011-2012 and how the historic material has been categorized by the BAC/HPO in their inventory.

FireCloud, Dorothy (Montezuma Castle NM - National Park Service)**[174] Continuity and Conflict in the Preservation of a Spiritual Landscape**

Also known as Bears Lodge or Mato Tipila, Devils Tower is a sacred site for many American Indian tribes. It is also America's first national monument (1906). This paper will describe the efforts to protect the site and accommodate American Indian people to continue their religious practices and sustain their religious associations with the site. Conflicts arose in the late 20th century as mountain climbers claimed rights to use the site in ways that impacted traditional religious practices. This presentation will describe the evolution of this dispute, the associated court cases and eventual administrative settlement that has been put in place to lessen the impacts to the religious activities within the Monument.

Fischer, Christian (Cotsen Institute of Archaeology, UCLA), Ioanna Kakoulli (MSE and Cotsen Institute of Archaeology, UCLA), Sandra L. Lopez Varela (Universidad Autonoma del Estado de Morelos, Mexico), Christian De Brer (Fowler Museum, UCLA) and Kim Richter (Getty Research Institute, Los Angeles)

[253] The Jaina-style Figurine Project: Portable Technologies, Advantages, and Limitations

Of all sites in the Mexican state of Campeche on the Yucatán Peninsula's Gulf coast, the islet of Jaina has been in the spotlight for many years, principally, due to the very fine clay figurines found in great numbers within burial sites. Compared to the archaeological/art historical analysis, the archaeometry of Jaina figurines has been less extensive. The Jaina style figurine project applies a multiscale and multianalytical approach based on non-invasive and non-destructive testing for the chemical fingerprinting of the figurines and to investigate the degree of variability in the chemistry and technology among the figurines relative to the analytical uncertainties. Here we present preliminary data obtained using non-invasive technology based on spectral imaging (SI), X-ray fluorescence (XRF) spectroscopy and ultraviolet, visible, near infrared (UV/Vis/NIR) reflectance spectroscopy for the characterization of the clay body and blue paint decoration. The advantages and limitations of the non-invasive techniques employed will be discussed in the context of material heterogeneity and variability, geometry and stylistic features of the figurines.

Fischer, Christian [253] see Dolph, Brittany

Fish, Paul, Suzanne Fish (University of Arizona) and Todd

Pitezel (University of Arizona)**[97] Understanding Parallels: Cross-Cutting Elements among Borderlands Hill Sites**

In addition to being set apart topographically from predominantly lower elevation sites in their contemporary settlement systems, late prehispanic hill sites of the U.S.-Mexico Borderlands are also distinctive in layout and architecture. Archaeologists who work in the major cultural traditions of the Borderlands have terms for modal types of late hill sites that correspond to these broad cultural/geographic divisions, e.g. trincheras sites in northwest Sonora or atalayas in the Chihuahuan-centered Casas Grandes sphere. However, some elements of layout, architecture, and some other aspects of material culture at hill sites that might be termed "stylistic" or reflective of techno-style crosscut the major cultural boundaries. We examine intriguing examples of such cross-cutting parallels in terms of their significance for pan-regional ideology, broad commonalities in symbolism and ritual practice, and intercultural contacts.

Fish, Suzanne [97] see Fish, Suzanne

Fish, Suzanne (Univ. of Arizona) and Suzanne Fish (Univ. of Arizona)**[97] Time and Place: The Role of Rio Magdalena Trincheras Sites in Their Settlement System**

Members of the Trincheras Tradition in northwest Sonora constructed distinctive stone features on high places prior to A.D. 1250, but in the following late prehispanic timespan they joined neighbors throughout the international four corners in a proliferation of specialized hill sites. We contend that the Sonoran trincheras sites incorporated region-wide ideological concepts about elevated locations which different Borderlands societies express through variable and evolving modes of ritualization. Patterning within and among geographically and culturally related sets of hill sites affords a vital framework for understanding their societal significance in particular times and places. A case study from the Rio Magdalena Valley provides an opportunity to examine changing configurations of hill sites within a local settlement system and to explore the implications against a backdrop of full-coverage survey data and regional ethnographic practices.

Fisher, Erich (Arizona State University) and Curtis Marean (Arizona State University)**[10] Technical Considerations of Metadata Standards for Digital Spatial Archaeological Data**

Spatial data are fundamental to modern archaeological methodology. The diversity of data collectors, proprietary file types, and processing techniques, however, creates unique challenges for standardizing how these data are collected, stored, disseminated, and, most importantly, described. Describing data is so critical because no data can be used confidently by other researchers unless there is clear and systematic metadata. Here, we will review several common spatial data types (GPS, RADAR, and total station) and the processing techniques common to each data type. We will then make recommendations on implementing metadata standards and how these data are described in online data repositories and in publication.

Fisher, Victor (Towson University)**[48] Treatment of Archaeoastronomy in Introductory Textbooks and in American Antiquity**

A study done a decade ago indicated that there had been a growing appreciation of the "interdiscipline" of archaeoastronomy among archaeologists. A new survey of the comprehensive listings of major commercial publishing houses and university presses suggests that the status of archaeoastronomy has changed little in recent years. Also noted is the nature of the limited attention that this area of study has ever received in American Antiquity.

Fisher, Lynn (University of Illinois Springfield), Susan Harris (Santa Barbara, CA), Jehanne Affolter (AR-GEO-LAB, Neuchâtel, CH), Corina Knipper (Johannes Gutenberg University Mainz) and Rainer Schreg (Römisch-Germanisches Zentralmuseum)

[142] *Linking Quarry and Settlement on the Swabian Alb (Southern Germany)*

Beginning in the Early Neolithic and increasingly in the Middle and Later Neolithic in Europe, considerable energy was invested in quarrying and mining chert and flint for tool production. Acquisition of stone combined local sources with regional transport. Chipped stone was used in everyday activities and for objects that likely played special roles in exchange networks. Linkages between quarries and surrounding landscapes thus can shed light on patterns of travel, work, and trade at local and regional scales. However, archaeologists are rarely able to link quarries and settlements in a detailed analysis. This paper reports on a long-term regional project investigating chert acquisition and tool production in quarry and settlement contexts in a chert-rich upland in southern Germany. We combine collections analysis, archaeological and geophysical survey, and targeted test excavations to compare assemblages from a large open-pit quarry complex (Asch-Borgerhau) and from settlements at varying distances. Systematic, non-destructive petrographic characterization of chert enables us to trace material from the quarry and from other sources to settlements. The combined results of these complimentary analyses offer great potential for exploring chronological and spatial variation in stone acquisition, tool production, and activities on a Neolithic landscape.

Fisher, Philip [150] see Adams, Jacob

Fisher, Philip (Washington State University)

[150] *An Experimental Examination of Human Transport Wear Compared to Post-Depositional Process on Obsidian Bifaces*

Examining bifaces for characteristics of human transport wear compared to nonhuman wear has received little attention in archaeological studies. Recognition of both types of wear on bifaces can help researchers understand aspects of human circulation around the landscape, caching behavior, and stone tool production and use strategies. This investigation includes the replication of bifacial cores and bifacial blanks made from obsidian. Those specimens were exposed to the effects of transport and other taphonomic processes such as sediment erosion and water rolling. Results of the experimental component were compared to excavated obsidian bifaces recovered from a prehistoric cache. Ultimately, our research shows that transport wear can be discerned from other kinds of wear on obsidian bifaces and that the excavated cached bifaces showed both kinds of wear.

[150] *Chair*

Fitzgerald, Richard (Richard Fitzgerald California State Parks), Nathan Stevens (Far Western Anthropological Research Group) and Jeffrey Rosenthal (Far Western Anthropological Research Group)

[12] *The Dye is Cast: Migration, Cultural Diversity, and Boundaries of Prehistoric California 12,000 to 8000 Cal B.P.*

California's well documented prehistoric linguistic and cultural diversity can be traced at least as far back to the Pleistocene-Holocene transition when distinct cultural traditions were formed during a period of significant climatic and environmental change. Against a backdrop of profound transformations in the biogeographical distribution of plant and animal species, newly arrived populations responded with a variety of nuanced broad-spectrum economies that generally featured intensive gathering and processing of terrestrial plants and marine resources. In this paper we review the roots of California's socio/cultural diversity

through an examination of its earliest cultural traditions and how these initial groups painted the broad strokes of California prehistory.

Fitzhugh, William

[31] *Discussant*

Fitzhugh, Ben (University of Washington)

[167] *Promises and Perils of Social Networks for Relatively Insular Populations*

Social networks are often considered beneficial for groups living on remote islands and in other relatively insular locations. They provide avenues for the flow of non-local information, resources, and mates, and a safety net in hard times. Extensive social networks also involve risks for insular communities, including asymmetrical dependence, unequal exchange rates, and vulnerability to both invasion and abandonment. This paper explores these conditions through events documented in the archaeology and ethnohistory of the Kuril archipelago in the Northwest Pacific. These examples help to sketch a more general model of strategies for sustainable settlement in remote locations.

Fitzhugh, Ben [233] see MacInnes, Breanyn

Fitzpatrick, Scott [2] see Giovas, Christina

Fitzpatrick, Scott (University of Oregon), Greg Nelson (University of Oregon) and John Krigbaum (University of Florida)

[27] *Palau's Position in the Colonization and Settlement of the Pacific: New Perspectives from the Chelechol ra Orrak Rockshelter*

The Chelechol ra Orrak rockshelter is a multi-component site in Palau (western Micronesia) which contains one of the Pacific's oldest human cemeteries (ca. 3000 B.P.). Subsequent occupation and site use span up to the historic period, including the quarrying of stone money by Yapese islanders. Archaeological research since 2000 provides important insight into a wide spectrum of human activities, ranging from early mortuary behaviors to later subsistence strategies and engineering feats. In this paper, we present a synopsis of several field seasons of excavation at the rockshelter. Results from osteological, zooarchaeological, artifactual, radiocarbon dating, and stable isotope analysis help contextualize Palau in the broader realm of Pacific Island prehistory.

[167] *Chair*

Flad, Rowan (Harvard University)

[146] *Prehistoric Globalizing Processes in the Tao River Valley, Gansu, China*

Dramatic technological changes occurred in China during the period from the third to the second millennium B.C. These include developments in specialized pyrotechnology, including metallurgy, and also significant changes in subsistence technologies with the introduction into China of new species of plants and animals. The modern province of Gansu, in northwest China, played an important role in the processes by which some of these technologies spread into new regions, stimulating developing social complexity. This paper outlines the background to these transformations and considers how we can proceed to investigate the relationship between these technological changes and contemporaneous environmental change in the region.

[179] *Chair*

Fladd, Samantha (University of Arizona), Saul Hedquist

(University of Arizona) and Leslie Aragon (University of Arizona)

- [43] *Ritual Deposition and Architectural Space: A Multi-Scalar Investigation of Identity Expression at Homol'ovi I*

In this paper we examine correlations between ritual deposition and architectural space at Homol'ovi I, a late prehispanic Hopi village located in northeastern Arizona. We focus on the content and architectural context of deposits containing turquoise to explore strategies of ritual consumption and identity expression. Our analysis is two-fold. First, we investigate compositional and structural variation among turquoise deposits (i.e. associations between turquoise and surrounding sediments and artifacts). In doing so, we consider differences in the social uses of turquoise from distinct geologic sources based on recent geochemical investigations of turquoise provenance. Second, we examine the morphology, function, and spatial and temporal contexts of architectural features having turquoise to examine their relationship to adjacent rooms and the site as a whole. This multi-scalar approach to the use of space permits a more holistic understanding of material associations at Homol'ovi I, thus providing greater insight into social practice, identity expression, and community organization at the site.

- [43] *Chair*

Flas, Damien (FNRS / University of Liège)

- [222] *Middle Paleolithic Blade Industries and Early Upper Paleolithic with Carinated Bladelet Cores: New Data from Kulbulak (Uzbekistan)*

In Central Asia, sites such as Khonako and Khudji (Tajikistan), Obi-Rakhmat (Uzbekistan), and now Kulbulak, have yielded early blade (and sometimes bladelet) industries, estimated to date between OIS 7 and OIS 3. At Obi-Rakhmat and Khudji, human remains have also been found but their anatomical attribution is debatable. The chronology and role of these early blade industries remain unclear and their relation with the "Initial Upper Paleolithic" and with a tentative modern human dispersal in Asia should be assessed.

During a more recent phase (second half of OIS 3), the same region shows the development of industries marked by the production of bladelets knapped from carinated cores, as is the case for Kulbulak layer 2 and at other Central Asian sites. These industries have sometimes been considered part of the Aurignacian complex and related to the dispersal of anatomically modern humans.

New data obtained during recent excavations (2007-2010) at Kulbulak, an open-air site at the western base of the Tian-Shan Mountains, enables discussion of these different industries and their potential role in Late Pleistocene population dynamics in Central Asia.

- [222] *Chair*

Fleming, Michael A. [219] see Toomay Douglas, Michele

Fletcher, Roland (University of Sydney)

- [104] *The Theoretical Implications of a Historical Archaeology of SE Asia*

The development of the Historical Archaeology of the European expansion and the Industrial Revolution has yielded the "revelation" that the textual record and the archaeological record are not the same. Even more significantly it has revealed the obvious - that the textual record and oral traditions are not the best and preferable record. They are simply particular kinds of records relevant to particular topics, questions and issues. The record of the material activities of human beings and their consequence is another and different resource for understanding the past - even the past of yesterday - as has become apparent in contemporary archaeology. This means that the types of questions we might ask and the answers we might seek need no longer be bounded by the habitual questions that are asked using texts and the spoken

words. A new ontology of archaeology follows from the development of a Historical Archaeology

- [15] *Discussant*
[49] *Chair*

Flexner, James (Washington and Lee University)

- [255] *The Historical Archaeology of States and Non-States: Anarchist Perspectives from Hawaii and Vanuatu*

Patrick Kirch's work throughout Oceania has been driven by the idea that islands lend themselves especially well to comparative analysis. Recently, Kirch has argued that Hawai'i represents what may be a unique example of archaic or primary state emergence in the pre-contact period in Polynesia, based on evidence that the most elaborate forms of Oceanic socio-political hierarchy, ideological control, and agricultural intensification evolved in the Hawaiian archipelago. In the islands of Vanuatu, in contrast, elite power was much less institutionalized, and nothing state-like had emerged in the archipelago at the time of European contact. Starting from two very different forms of social organization, the colonial and post-colonial histories of Vanuatu and Hawai'i are markedly different as well. Archaeology has a useful role to play for understanding why this might be, both because of its emphasis on space and material culture, and because it can provide a perspective that reaches beyond the limited documentary sources available for people living on the peripheries of state power in the modern world. Archaeological materials from Vanuatu and Hawai'i will be used to explore the ways that social dynamics inflected by states and those that avoid or resist the state may have shaped island histories.

Flexner, James [292] see Spriggs, Matthew

Flint, Sandra

- [270] *The Highs and Lows of Hydroelectric Projects: The Effects of Changing Water Levels on Archaeological Resources*

The Federal Energy Regulatory Commission (FERC), or its predecessors, issued the initial licenses to operate and maintain hydroelectric projects in the U.S. for terms extending up to 50 years. Over the past decade, these licenses have begun to expire and utility and energy organizations have been busy applying for new licenses that will endure for another 30 to 50 years. Unlike past licenses, current federal laws and regulations require that historic properties be taken into account as part of the new relicensing process. HDR Engineering, Inc. has played an integral role in many of the recent relicensings, identifying and documenting various project-related effects on archeological sites. This poster explores the positive and negative effects of wave action and fluctuating water levels at archaeological sites as one of the most prominent issues observed during relicensing efforts, and presents a variety of non-invasive treatment approaches, including the application of geo-textiles and capping with rip-rap.

Flood, Jonathan [213] see Luzzadder-Beach, Sheryl

Floyd, Bruce (University of Auckland) and Ben Davies (University of Auckland)

- [27] *A Question of Oceanic Proportions: Demographics, Migration, and Morphology in Remote Oceania*

Peoples in Remote Oceania tend, on average, to be moderately tall, with relatively broad shoulders and hips as compared to people from probable source populations identified in recent genetic and craniometric studies. While various explanations have been offered, a common theme is the role played by repeated genetic bottlenecking. We have constructed a computational, agent-based demographic model to examine the effects of serial

migration on the probability of change in body dimensions in a human population. Agents within the model age, and are subject to age- and sex-specific mortality risks and fertility estimates. Initial anthropometric distributions and variable estimates are derived from a variety of populations intended to represent a range of possibilities. Individuals' adult body sizes are simulated using standard-normal distributions of height, biiliac breadth, and biacromial breadth. These are correlated within individuals and are transmitted from parents to offspring in a biologically plausible manner, and correlations between parents and offspring and among offspring also vary within biologically plausible ranges. Finally, regional archaeological studies are used to provide temporal constraints for colonization events. Multiple scenarios are evaluated, suggesting that repeated bottlenecking events alone are not sufficient to explain this phenomenon. Alternative hypotheses, and means of assessing them, are discussed.

Foin, Jeremy [71] see Darwent, Christyann

Foin, Jeremy (University of California, Davis), Mark Grote (University of California, Davis) and Naoki Saito (University of California, Davis)

[204] *Identifying Prehistoric Thule Inuit Architectural Traditions Using Laplacian Shape Analysis: Preliminary Results*

Architectural theory indicates that the organization of the built environment tends to strongly channel physical interactions between its inhabitants, implying that people allocate living space in culturally specific ways. By extension, shared design elements can be construed as ethnic markers embedded in a mental template of the culturally-determined "ideal" way of constructing dwellings. However, identifying architectural traditions in widely-dispersed Thule (ca. AD 900-1500) archaeological sites has historically been complicated by profound differences in raw material availability, which constrain design possibilities in very different ways. A novel approach is proposed that uses advanced shape analysis to statistically quantify the degree of similarity between dwellings from the western, central, and eastern Arctic. This technique translates digital tracings of house floors into numerical feature vectors, which are used to construct a Laplacian matrix that summarizes the most salient characteristics of the feature set. This poster presents the outcome of a feasibility study that uses Laplacian pattern recognition to detect spatial patterning in a sample of early Thule winter houses from sites in Alaska, the Canadian Arctic, and western Greenland. Results of this analysis are compared with the distribution of temporally diagnostic artifacts, and implications for current understanding of the Thule expansion are discussed.

Fondak, Ted [125] see Goodale, Nathan

Fondebrider, Luis [193] see Tuller, Hugh

Fondebrider, Luis (EAAF), Miguel Nieva (EAAF), Juan Nobile (EAAF), Selva Varela (EAAF) and Diego Argañaraz (EAAF)

[193] *Archaeological Investigation of Mass Graves Containing Burned Remains*

Burning bodies is a fairly usual practice in cases of political and ethnic violence. The purpose is to eliminate the bodies, hide any remains of them, and prevent any process of identification and determination of the cause of death. From an archaeological viewpoint, the excavation and interpretation of sites containing structures for burning bodies poses a challenge to forensic anthropologists from both the methodological and interpretive perspectives. This paper presents two complex cases related to the human rights violations that occurred in Argentina between 1976 and 1983, during the last dictatorship in the country. The first case involves mass graves found on the premises of a former clandestine detention center, where about 300 persons were

kidnapped and tortured, and some were executed and subsequently burnt inside the premises. The second one also concerns a clandestine detention center where an estimated hundreds of people were detained before they disappeared. In this case, the mass graves that contained the bodies were also used as structures for burning them, but sometime after the events an operation was conducted to remove the remains from the place.

Fong, Kelly (University of California, Los Angeles)

[99] *From the Ground Up: Transforming Historical Archaeologies into Social Histories*

Historical archaeologists have become increasingly attentive to public outreach to share archaeological findings, whether in the form of public archaeology days, blogs and websites on the Internet, or public lectures. While sharing our learned knowledge is extremely important, I find there is room for more in-depth community engagement. How do we move beyond simply sharing our knowledge after completing our work and instead make our descendant communities an integral part of the entire research process? This paper explores what historical archaeologies inspired by Ethnic Studies-style social histories might look like, where archaeologists are in constant dialogue with the community. Written 'from the ground up,' archaeological social histories explore individuals and communities who have otherwise been written out of mainstream history from a community-oriented perspective and force us to reconsider who our stake holding audiences are. Drawing upon archaeological work on the rural 20th century Chinese American community in Isleton, California, this paper discusses the benefits of continual collaboration with historical societies and descendant communities, which transform this research into a more meaningful narrative of the past that benefit archaeological, academic, and community audiences alike.

[99] *Chair*

Fonseca, Enah [91] see Fenoglio, Fiorella

Fonseca Ibarra, Enah Montserrat (INAH) and Fiorella Fenoglio Limón (INAH)

[91] *Protección del Patrimonio Arqueológico: Un Pasado en un Presente*

Hoy en día la gestión para la protección del patrimonio cultural debe ser una de las actividades fundamentales del quehacer arqueológico; resulta fundamental trabajar con las sociedades vivas, estudiar el pasado pero sin perder de vista los problemas que enfrentamos a nivel local y regional en el presente. Conscientes de esta problemática hemos emprendido una serie de estrategias tendientes a promover el trabajo con diversos sectores sociales a fin de proteger el patrimonio cultural arqueológico.

Específicamente en el caso del norte de México, el principal problema de afectación de los sitios arqueológicos es el desconocimiento de las características de la cultura material que dejaron los habitantes de esta región en el pasado. Es por ello que deben implementarse de manera conjunta con las autoridades estatales y municipales, estrategias para su difusión y protección.

Fontes, Lisa (University of New Mexico), Lawrence Straus (University of New Mexico) and Manuel González Morales (Universidad de Cantabria)

[220] *Spatial Distributions of Lithic Artifacts in the Lower Magdalenian Levels of El Mirón Cave, Cantabria, Spain*

Previous research on the lithic assemblages at El Mirón Cave (Cantabria, Spain) has indicated spatial and temporal variation within the Lower Magdalenian stratigraphic sequence. Lithics from the earliest Lower Magdalenian show an emphasis in bladelet technology, whereas later Lower Magdalenian lithics indicate greater emphasis on processing and maintenance tools--

endscrapers, denticulates, and burins. These differences correspond to shifts in spatial density and distribution of lithic debris. This paper expands upon our previous work by evaluating spatial difference in these Lower Magdalenian samples using statistical methods. Here, we identify which lithic concentrations are statistically significant, focus on analysis of the kinds of activities occurring in each artifact cluster, and comment broadly on lithic technological organization at El Mirón in relation to other Lower Magdalenian sites in the Cantabrian region.

Foor, T. A. [120] see Bobbitt, Mary

Foran, Brendan [253] see Walton, Marc

Forbis, Adam (Humboldt State University) and Jeff Bryant (Chico State University)

[213] *Lithic Overview of the Dos Hombres to Gran Cacao Archaeology Project*
The Dos Hombres to Gran Cacao Archaeology Project (DH2GC) has surveyed, excavated, and gathered a variety of lithic artifacts during the 2011 and 2012 field seasons. Artifacts collected include chert flakes, debitage, one complete chert biface, obsidian prismatic blade fragments, obsidian flakes, and others. The most notable find during excavations are possible specialized, reworked chert tools located within Operation 4 of the DH2GC. These tools are interesting because they are confined to a specific area on the project transect. Various data sets can emerge from macroscopic and spatial analysis. Use-wear from macroscopic analysis on flakes, bifaces, and prismatic blades can be used to determine the functionality of the tool or flake. Each lithic artifact was cataloged in a database along with material type, tool or flake type, cortex amount, and type of striking platform. Provenience data was also input into the database in order to conduct a spatial analysis that shows lithic concentration within the project area. Analysis of these datasets will give a clearer picture of manufacturing processes, tool use, and movement of raw material and tools within the ancient Maya world.

Ford, Ben [257] see Neusius, Phillip

Forde, Jamie

[140] *The Pueblo Viejo of San Miguel Achiutla, Oaxaca, Mexico: An Abridged Life History*
The archaeological site known as the "Pueblo Viejo" to contemporary residents of San Miguel Achiutla constituted the core of one of the most important centers in the Mixteca Alta region of Oaxaca during the Postclassic period. Its significance at this time likely owed in part to its associations with earlier ruined sites, as well as to indigenous beliefs regarding the future. In this paper, results of recent archaeological field research at Achiutla are presented and augmented with ethnohistorical data. While focused on the Postclassic period, I approach these data here by way of a "life history" perspective, to examine how Achiutla's community organization and meanings associated with its location both changed and persisted over time, from the Formative period up to the modern day. I argue that these changes and continuities have resulted from a dynamic interplay of concerns with past, present, and future over the course of the site's history.

Forde, Jamie [140] see Levine, Marc

Forné, Mélanie [144] see Arnauld, Charlotte

Forrest, Crystal [42] see Kelly, Johanna

Forringer-Beal, Anna (University of Michigan)

[121]

What Little Remains: Examining the Impact of Desert Conservation Efforts on the Archaeological Record of Undocumented Migration in Southern Arizona.

Since 2001, a great deal of energy has been focused on highlighting the impact that undocumented migrants have on the Sonoran Desert and directing efforts to clean up the things that they leave behind. Some characterize the objects left by migrants as simple "trash", while others (including those with the Undocumented Migration Project [UMP]) argue that they are artifacts to be studied and preserved. One issue that the UMP faces is that much of the archaeological record of migration has been destroyed by conservation efforts. Since 2010, the UMP has been documenting what is left behind when migrant campsites (known as "migrant stations") are cleaned up and examining what can be gleaned from analyses of the micro-fragments of backpacks, water bottles, and other objects that often remain. I present data from an ongoing study of how desert cleanup efforts have impacted the archaeological record including a comparison of data from cleaned-up sites with intact migrant stations. I argue that the micro-remains of migrant stations offer insight (albeit incomplete) into the process of border crossing including information about demographics and embodied experiences. I also demonstrate that these results have important implications for understanding the archaeological record of historic and ancient migrations.

Forte, Maurizio [9] see Issavi, Justine

Forte, Maurizio (University of California, MERCED)

[247] *3D-Archaeology: New Perspectives and Challenges*

In modern archaeology large amounts of data are nowadays generated through the use of 3D technologies such as laser scanners, photogrammetry, digital photography, computer vision and other forms of digital recording process. The amount of data available in post-processing and for the interpretation of the excavation process is enormous in comparison with the past. Does this facilitate the virtual reproduction of all the phases of excavation? Can we really see the unseen?
In this paper we want to discuss the hermeneutic impact but also the troubleshooting of these technologies in the process of documentation, data recording and reconstruction of the interpretation process. Beside the spectacularization of all the archaeological work through 3D digital visualizations, is this approach radically changing the archaeological interpretation and how? Do we have new research questions after all?
More specifically, the author will discuss the project 3D-Digging at Catalhuyuk (directed by UC Merced), started in the summer 2010 in the East Mound of the site. This archeological project aims to virtually reproduce the entire archaeological process of excavation using 3D laser technologies on site and 3D Virtual Reality of the deposits of Catalhoyuk as they are excavated.

Fortin, Louis (Washington State Univ.) and Susan DeFrance (University of Florida)

[148] *Maritime Adaptations and a Paleoindian Lithic Assemblage at Quebrada Tacahuay*

Quebrada Tacahuay in south coastal Peru contains some of the earliest archaeological examples of maritime adaptation in the Americas. During the 1997, 1998, and 2001 field seasons, archaeological material suggested the presence of subsistence specialization of marine resources, in addition to stone tool manufacture and use. By defining the lithic technology (acquisition through discard) present at Quebrada Tacahuay one can further develop an understanding of their adaptive choices. The dominant tool type and lithic debitage found throughout all field season excavations of Quebrada Tacahuay was chalcedony, a fibrous cryptocrystalline silica found regionally in quebrada drainages and volcanic ash lenses. This preliminary study evaluates the spatiotemporal variability present in the lithic assemblage in order to differentiate and understand the cultural activity. Defining the

variability in material will aid in discerning the use of multiple geologic sources, variability in retouch on tools and quantity of retouch flakes will aid in determining the amount and extent of tool use within the lithic assemblage as it relates to marine subsistence specialization.

Fortin, Louis [224] see Nanavati, William

Fosberg, Stephen [91] see Wescott, Konnie

Foster, Thomas (University of Tulsa)

[81] *Coalescence of the Protohistoric Muscogee Creek People as Revealed through Pottery Analysis*

The Creek Indians were an amalgam of Muskogee speaking people who lived in the southeastern United States. This paper describes research of the Apalachicola Ecosystems Project that reveals information about how the Native American community of Apalachicola adapted and survived social and environmental changes between about 1500-1800 AD. Apalachicola was the considered the capital of the Creek Nation until the middle of the eighteenth century. Pottery analysis from the town reveals significant changes in this community that are interpreted in the context of cultural resilience and change during the formation of the Creek Confederacy.

Foster, David [207] see Doucette, Dianna

Fowler, Don (University of Nevada Reno)

[110] *Discussant*

Fowler, Catherine (University of Nevada)

[218] *Discussant*

Fowles, Severin (Barnard College, Columbia University)

[218] *On Pueblo Emergence*

In his remarkable exploration of the contrast between Christianity and Native American religions, Vine Deloria emphasized a fundamental distinction that was at once metaphysical and moral. Whereas Christians, he argued, vest their identities in history and the unfolding of a universal biblical narrative, Native Americans vest their identities in places and the specificity of particular landscapes. A great deal unfolds from this, especially when considering the experience of long-distance relocations in space and the effects this would have had on individual and group identities. Here, I draw on the case of thirteenth century immigration into the northern Rio Grande as a means of considering two implications: first, that placed-based identities do not change naturally with the movement into new landscapes but are instead associated with formal techniques of becoming indigenous; and second, that these techniques raise the question of whether pre-Columbian Pueblo communities would have had any conception of the Western idea of a "core" that stands apart from a "frontier" or of a "homeland" from which one could be alienated.

[14] *Discussant*

Fowles, Severin [85] see Santiago, Emilio

Fox, Mathew, Jennifer Kielhofer (University of Arizona) and Ye Wa (Shaanxi Provincial Institute of Archaeology)

[184] *The Micromorphology and Site Formation of*

Yangshao Ash Deposits at Yangguanzhai: A Miaodigou Village in the Wei River Valley, China

The Wei River Valley in north-central China is considered a principal epicenter where the development of agriculture, ceramic technology, animal domestication, and Neolithic subsistence strategies began since the onset of the climatic amelioration approximately 12,000 years ago. Even though intensive archaeological investigations have been carried out for nearly a century, there remain critical aspects of Neolithic assemblages that have only either been qualitatively surveyed, or have remain completely unexplored by quantitative means. Therefore, in order to further understand behavioral characteristics of Neolithic peoples, and site formation processes that have operated since the time of deposition, 10 micromorphology samples were taken from an archetypal middle Neolithic (approximately 6000-5000 BP) refuse deposit at the site Yangguanzhai (YGZ). Since YGZ can be considered one of the foremost Neolithic localities to be discovered since the early 2000s and, additionally, the assemblage appears to demonstrate a wide variety of typical Neolithic behaviors (e.g. ceramic production, animal domestication, ash-filled refuse pits, etc.), it is an ideal site for a geoarchaeological pilot study utilizing soil micromorphology. Petrographic analysis of the archaeological sediments will demonstrate if ash deposits at YGZ were part of standardized refuse activities or simply redeposited by the highly active Wei River.

Frachetti, Michael (Washington University in St. Louis)

[146] *The Inner Workings of the Inner Asian Mountain Corridor and the Archaeology of Highland "Nomads"*

Trade and communication along the Silk Routes are defining elements of Inner Asian interaction during historical times. Yet little detailed archaeological attention has been paid to the way such interactions functioned and who was in control in prehistoric times. This paper presents new archaeological data excavated along the Inner Asian Mountain Corridor -- a corridor linking the Pamir Mountains in the south the Altai Mountains in the north -- which illustrates how various strategies of production and consumption on the part of highland mobile pastoralists functioned to fuel the wide expansion of technologies and distribution of Inner Asian materials and institutions as early as the 3rd millennium B.C.

[225] *Discussant*

[146] *Chair*

Frahm, Ellery (University of Sheffield)

[62] *Place, Practice, and pXRF: Merging Archaeological Fieldwork and Labwork*

The reason for archaeologists' interest in handheld portable X-ray fluorescence (pXRF) is clear: the potential to acquire chemical data quickly in the field can transform the ways in which we approach research questions involving compositional information. PXRF offers our discipline new possibilities of how, where, and why to analyze as well as the ability to sample at unparalleled scales. The capability of pXRF instruments to function outside of the conventional analytical context -- the laboratory -- raises questions about performance and best practices. The laboratory is typically viewed as a controlled environment where careful measurements may be objectively undertaken, whereas the field is considered the opposite. There are, however, archaeological approaches and applications well suited to chemical analyses outside the analytical laboratory. Most importantly, pXRF can bring researchers together in a common context of practice, one in which archaeological investigation, analysis, and interpretation are synchronized in the field and with coherent research objectives. Identifying differences between field and laboratory practices is a key goal of the Marie Curie Training Network "New Archaeological Research Network for Integrating Approaches to Ancient Material

Studies" (NARNIA), as is establishing effective methodologies for field-based investigations. This talk summarizes the work thus far toward those goals.

Francisco, Francisco [202] see Luo, Wugan

Franco, Nora (CONICET-UBA), Luis Borrero (CONICET-UBA), George Brook (University of Georgia) and María Virginia Mancini (University of Mar del Plata)

[28] *Changes in Technological Organization and Human Use of the Space in the South of Patagonia (Argentina) during the Late Holocene*

Technological organization can provide useful information about human use of the space. In this paper we discuss changes in human use of the southern part of the Upper Santa Cruz basin during the Late Holocene and their relationship to recorded paleoenvironmental changes. Variations in lithic technology and raw material provenance information are used in order to understand how humans were using this area. Changes recorded during the Late Holocene are related to existing information on variation in water availability.

Frankland, Tom [125] see Earl, Graeme

Franklin, Elaine [257] see Franklin, Elaine

Franklin, Elaine (North Carolina Center for the Advancement of Teaching) and Elaine Franklin (North Carolina Center for the Advancement of Teach)

[257] *Disruptive Innovations and the Potential for New Pedagogies in Archaeology and Heritage Education: A View from 35,000 Feet*

Archaeology is by nature an interdisciplinary field of study, existing at the nexus of the sciences and the humanities. It can pose and investigate questions that are relevant to cultures across time and space; it has the power to engage minds as do few other disciplines—it is beautifully complex. This breadth, however, poses challenges for how to best prepare students for heritage professions. A further complication is the rapidly growing rate of knowledge production and the ease with which it can be accessed. These issues, along with the need to develop critical skills such as collaboration and problem solving, are not unique to heritage studies nor are they exclusive to higher education. Education in the early twenty-first century is being turned on its head; disruptive technologies are leading to, and allowing for, dramatic changes in teaching and learning. This paper places the challenges of educating new heritage professionals in the broader context of transformations that are occurring across the K-20 spectrum and presents some emerging pedagogies. Central to the discussion are the "coming of age" of interdisciplinary approaches, and changes in educational paradigms and power relationships resulting from the disruptions generated through digital innovations.

Fraser, Rebecca [83] see Vaiglova, Petra

Fraser-Shapiro, Ian

[77] *Tailor Made: A(n Evolutionary) Theory of Mobility to Suit Hunter-Gatherer and Scientific Archaeology*

The concept of mobility in archaeology is often taken for granted as a common sense term that comes with many implicit assumptions and leaves room for misinterpretation. The majority of explanatory models relating to mobility, and particularly hunter-gatherer mobility, are based in ethnography. The use of ethnographic models precludes our ability to recognize unfamiliar mobility structures in prehistory. The archaeological record is

analogous to a photo-negative of mobility providing physical evidence of the historical events understood to have been 'mobility'. Based on this I propose a model based on evolutionary theory that will help to better understand and develop new measures of mobility for prehistoric applications.

[77] *Chair*

Frederick, Wendy

[112] *Ainu Identity and Expressive Culture*

Ainu carving, weaving, embroidery, and music are of high aesthetic quality. Traditionally, these activities were a part of their daily lives rather than separate activities. The Hokkaidō Ainu relied on garments made of plant fibers, while the Sakhalin Ainu wore garments made of fish skin and animal hides. The Kurile Ainu utilize basketry, and used land and sea mammal hides and bird feathers for their clothing. Among the Hokkaidō Ainu, the culture hero descended from the world of the deities in the sky and taught the Ainu their way of life, including fishing and hunting and the rituals and rules governing human society. What does such a fibrous culture really look like? What are its forms, its functions? Prehistory naturally has only very fragmentary sources but, in the framework of the anthropological definition of material culture the hypothesis can be tested in the domain of ethnology (Hirschberg 89). What do these signify today? Can we see evidence of this in structures today and what is the impact? This presentation outlines an open system of 'fibro-constructive' possibilities which allows for a wide range of developments in regard to its social, spatial, psychological, and particularly communication components.

Freeburg, Adam [71] see Darwent, Christyann

Freeland, Travis (Simon Fraser University, Department of Archaeology)

[268] *An Assessment of Portable X-ray Fluorescence (pXRF) for Ceramic Compositional Analysis*

Portable X-ray fluorescence (pXRF) technology has seen increasing use in archaeology in recent years, a trend viewed with both enthusiasm and skepticism. PXRF is fast and cost-efficient, capable of non-destructive analysis in the laboratory and in the field. However, its low-powered, miniaturized componentry make it susceptible to error due to sample surface irregularities and chemical heterogeneity. This affects its utility for bulk analysis of archaeological ceramics, since these issues may be amplified in cases involving coarse-grained, synthetic materials. I present the results of an assessment of pXRF on ceramic sherds from geographically- and technologically-distinct assemblages, including low-fired earthenwares from prehistoric sites in Fiji and Tonga, as well as Woodland period sites in southern Ontario, Canada. Samples are analyzed by pXRF to measure chemical variability. Where significant variance occurs, attempts are made to attribute anomalies to one of several factors known to impact pXRF results: the presence of surface coatings (slips, organic or mineral adhesions); weathering of the surface; or coarse-grained temper inclusions. Chemical variation exceeding the impact of these factors may be interpreted as representing distinct ceramic paste recipes. The results inform a discussion of statistical grouping, diagnostic elements, and research design to best exploit the advantages of non-destructive pXRF.

Freeman, Jacob (Arizona State University) and John M Anderies (Arizona State University)

[23] *A Model of Hunter-Gatherer Intensification*

We present a dynamic model of hunter-gatherer intensification on open access resources. The model paints a rich picture of the process of intensification that includes both gradual changes in behavior and the potential for novel forms of social organization to evolve. Specifically, the model is used to isolate the ecological contexts in which selection operating at the level of individuals and

at the level of a social-ecological system might favor the evolution of resource ownership institutions. The insights of the model are evaluated against a substantial ethnographic data set, and positive evidence is presented for alternative social-ecological regimes of foraging in the ethnographic record. It is concluded that hunter-gatherer groups who cooperate to recognize institutionalized resource ownership use less territory than groups who do not cooperate to recognize such institutions. Institutions partly determine how intensively foragers use a landscape and are a necessary component of any theory of intensification.

Freeman, Katherine [172] see Magill, Clayton

Freidel, David (Washington University in St. Louis), Olivia Navarro Farr (College of Wooster) and Michelle Rich (Southern Methodist University)

[63] *Evidence for Teotihuacan-Maya Interaction at El Perú-Waka'*

Kaloomte', Supreme War Lord, Siyah K'ahk' arrived and set in place a new government at El Perú-Waka' 7 January 378 AD as inscribed on Stela 15 there. This regional conqueror was depicted as a Teotihuacano carrying a fire bundle on Stela 16. According to Stela 15 he carried out an event in a Wi Te' Naah Fire Shrine. We review evidence that two buildings at the site might have been such shrines. Both of these buildings are adosada shrine pyramids of the kind identified at Teotihuacan as fire shrines. They are the only true adosada shrine pyramids in the Maya lowlands. There is clear evidence that one of these shrines contains sacrifices dating to the period of the Early Classic incursion and that the other has a commemorative fire hearth dating to the Terminal Classic.

Freiwald, Carolyn (University of Wisconsin)

[144] *Urban and Rural Population Movement Patterns during the Late and Terminal Classic in the Belize River Valley*

Population movement in the Maya lowlands during the Late and Terminal Classic (AD 600-900) was not uncommon. Isotopic analyses at Tikal and Copan have identified long-distance immigration into the Maya cities, but substantial population movement also occurred at the medium-sized and rural centers of the Belize River Valley. Strontium and oxygen isotope values in the tooth enamel of 148 individuals show that nearly 25 percent of residents buried at 15 sites had relocated at least once between birth and burial. While migration patterns at each site reflect unique settlement and political histories, the same overall trends are evident: diverse, mostly regional population movement that crosscuts the population. Men, women, and children moved into rural communities as well as urban centers, and higher incidences of dental modification may signal an individual's non-local origin. However, burial treatment for individuals born within the valley did not, suggesting that social organization could accommodate the population flux. The landscape during the Classic period likely was a dynamic and mobile one, even before the demographic changes of the Maya collapse.

French, Kirk (Pennsylvania State University), Timothy Murtha (Pennsylvania State University), David Webster (Pennsylvania State University) and Christopher Duffy (Pennsylvania State University)

[58] *Modeling the Interplay of Land and Water at Tikal, Guatemala*

This paper investigates the long-term spatial and temporal dynamics of land use, agricultural decision-making and patterns of resource availability in the tropical lowlands of Central America in the region of Tikal, Guatemala. Our project combines diachronic environmental simulation with historic settlement pattern and environmental survey to address a series of long-standing questions about the coupled natural and human history in the Central Maya lowlands. We are investigating changing patterns of land, water, population, settlement and political history for a three

thousand year period using climate, soil and hydrologic modeling and time series spatial analysis of population and settlement. Building on previous and comparative research completed in other parts of the lowlands, we are modeling the 3,000-year history of the region, comparing land and water availability to population distributions and what we know about political history, primarily relying on the Penn State Integrated Hydrologic Modeling System (PIHMGis) and the Erosion Productivity Impact Calculator (EPIC). Importantly, we are also analyzing the spatial patterns of land and water availability under simulated conditions of drought, thereby investigating the potential influence of extreme climate events as compared to the cultural history of the Ancient Maya.

French, Kelly

[120]

Lithic Technology at the Bridge River Site

This poster analyzes lithic technological organization and tool morphology at the Bridge River site in the Mid Fraser Canyon during the Fur Trade era. I examine the complete lithic assemblage excavated in the summer of 2012 using the chaine operatoire ("sequence of actions") approach. I divide the technological system into three main categories: raw material procurement, tool production, and tool kit management. By looking at the chaine operatoire in the major material and tool classes, I gain more insight into tool production at winter pithouses in the Interior Plateau of British Columbia. More specifically, I test models derived from the ethnographic record and previous archaeological studies.

Freund, Kyle (McMaster University)

[279]

Towards an Understanding of the Archaeological Questions that Drive Obsidian Characterization Studies in the Pacific Rim of Fire

This presentation provides a broad overview of the current state of play of obsidian characterization studies in the Pacific Ring of Fire. More specifically, this presentation thematically characterizes the archaeological questions that are relevant to Pacific Rim archaeologists and how obsidian sourcing data are used to address these issues. This includes discussions about what archaeological questions have been asked of obsidian sourcing data and why, what questions cannot be asked of the data, and what potential questions can be asked in the future.

It is further argued that a broader contextualization of provenance data, including information about the form and function of archaeological objects, leads to a more informed theoretical position that is capable of making a meaningful contribution to our ongoing investigation of people of the past. By outlining larger trends in obsidian sourcing discourse, it becomes possible to understand how studies in specific regions within the Pacific fit in with broader archaeological research objectives.

[279] *Chair*

Friberg, Christina (University of California, Santa Barbara)

[54]

The Politics of Identity and Ideology during the Woodland to Mississippian Transition in the Central Illinois River Valley

The Eveland phase (A.D. 1100-1200) inhabitants of the Central Illinois River Valley (CIRV) adopted a suite of Cahokian cultural practices. However, there are differences with the Mississippian American Bottom that cannot be ignored. This paper compares data on the production, decoration, and use of Ramey Incised jars from various sites in the CIRV with existing data from the American Bottom. The results of this analysis indicate that the inhabitants of the CIRV added a distinctively local flavor to the Cahokian ideologies and ritual practices they emulated, constructing new and unique identities.

Fridberg, Diana (Washington University in St. Louis), Olivia Navarro Farr (The College of Wooster), Griselda Perez Robles (Proyecto Arqueológico El Peru-Waka') and Damaris Menéndez (Proyecto Arqueológico El Peru-Waka')

[290] *The Animal Face of a Ritual Space at El Peru-Waka, Guatemala*

Recent excavations of a unique sub-surface chamber at El Peru-Waka', Guatemala, during the 2012 field season have yielded complex multi-faceted evidence for ritual use. The four-sided masonry chamber features a quadrilateral vault and is located immediately behind the northern terrace of the site's primary public temple complex, Structure M13-1. Although the exact function is unknown, it is likely that the chamber served a ritual function given its location and the complex stratigraphic sequence of recovered materials, among them a large quantity of animal remains from diverse taxa. This paper presents the results of excavation as well as the analysis of collected faunal materials. The faunal sample suggests that the manipulation of a diverse assortment of animal taxa from variable environments was an important part of ritual function.

Friedman, Lindsey, Hirofumi Kato (Hokkaido University), Andrzej Weber (University of Alberta) and Tamsin O'Connell (University of Cambridge)

[77] *Dietary Complexity amongst Hunter-Gatherers in Prehistoric Japan*

As early as the Jomon period (12,000-800 BC), we know that people across Japan had access to a wide range of plants including nuts and cereals, as well as many different species of bird, fish, and mammal. We also know that they had the knowledge and technology to make use of these resources. However, these remains are representative of available rather than consumed resources. This paper presents results of carbon and nitrogen isotopic analyses of human bone collagen to investigate hunter-gatherer diet in southwestern Japan. It considers trends related to site location, site type and site function, as well as investigating differences within populations based on age, sex, grave goods and pathologies. Further, by highlighting these results and recent archaeobotanical research on Rebun Island, Hokkaido, it raises questions about how we define "hunter-gatherers" in Japan.

Frieman, Catherine (Australian National University)

[168] *A Very Remote Storage Box Indeed... The Perils And Rewards of Revisiting Old Collections*

People have been collecting, dissecting and explaining Europe's prehistoric remains for centuries; and it is easy to come to the conclusion that no new revelations lurk in the dusty cardboard boxes which fill our museums. Even with new scientific techniques, most archaeological work on older collections is limited to the small number of objects with the best preservation and known contexts and associations; and these 'characteristic' artifacts underpin many of our models of prehistoric technology, economy and society.

In this paper, I will discuss my experience working within a variety of small and large museum collections while studying prehistoric lithics. I focus on some of the problems of using museum collections; however, I suggest that the hurdles should not deter us from returning to old collections. Even with poor records, poor preservation and no context, the objects themselves can reveal copious information about their production, function and deposition. I will demonstrate how a return to first principles can upend our understanding of the objects themselves and create new narratives of social and technological change. Digging through those storage boxes can be a daunting task, but I maintain that great rewards are possible for those fearless or foolish enough to persist.

Fries, Eric (UCLA)

[208] GIS-Assisted Survey and Predictive Model Testing in Western Belize

Previous work by Ford and Fedick in the Belize River Valley resulted in the generation of a predictive model for the location of Maya settlements in uninvestigated areas along the northern rim of the valley. Initial reconnaissance by the UCLA Maya Archaeology Project found the actual number and location of sites varied from the predictive model. GIS analyses, remote sensing, and pedestrian survey were employed to re-evaluate the survey area, locate previously unknown sites, and attempt to refine and amend the model suggested by Ford and Fedick, taking into account a wider variety of environmental and archaeological data.

Frink, Liam [130] see Giordano, Celeste

Frink, Liam (University of Nevada Las Vegas) and Karen Harry (University of Nevada Las Vegas)

[258] *An Experimental Examination of Central Canadian Arctic Hunter-Gatherer Pottery and Soapstone Containers*

Our initial foray into the study of ceramic production in northern North America was stimulated by our profound respect at the ability of western Alaskan women to produce even "ugly" pottery under environmental conditions that can only be characterized as a potter's nightmare. Here we turn our attention to ceramic containers found even further north, in the Central Canadian Arctic. Here, environmental constraints (fuel shortages and poor weather conditions) on ceramic production are similar to western Alaska, but even more extreme. In addition to facing problems in making the pottery, the people of the Central Canadian Arctic faced unique problems associated with their maintenance and use. Unlike the western coast, in this area an alternative cooking technology was present in the form of soapstone containers. We present the results of experiments undertaken to explore how these two materials compare in terms of engineering principles and performance characteristics. We then consider the broader social setting in which the technologies were employed, to examine how social and technological factors interacted to shape material culture.

Froehle, Andrew [256] see Fauvelle, Mikael

Fruhlinger, Jake (Idaho Army National Guard)

[281] *Geospatial Silverlight Viewer for Assessing Site Integrity and Site Relationships in Cultural Resource Data*

Starting in 1994, 31 sites eligible for the National Register of Historic Places have been monitored on a staggered biennial basis within the Orchard Complex Training Center in southern Idaho. The primary goals of the monitoring program are to assess public and military impacts to site integrity and to ensure that appropriate protective measures are in place. New geospatial data applications such as Microsoft Silverlight have more accurately allowed the Idaho Army National Guard to assess site impacts such as deflation and erosion that affect artifact provenience and overall site condition from year to year.

[281] *Chair*

Fu, Janling (Harvard University)

[191] *Longer-term Processes of State Formation in the Levant: The Case of Israel in the Iron Age II*

The Levantine polities that followed the widespread, systemic collapse of the Late Bronze Age palace economy attest to longer-term processes of social and cultural cohesion between tribe and state (Bourdieu 1970, 1977, 1990; Joffe 2002; Khoury and Kostiner 1990). Their rise can be viewed through anthropological models of gift-exchange and feasting as related to state formation (Dietler 1990; Dietler and Hayden 2001; Bray, ed. 2003;

Bunimovitz and Greenberg 2004). At the same time, they participated in, and were influenced by, broader patterns of interregional trends of trade, exchange and cultural influence. The case of Israel in the Iron Age II offers one example of an agent-based model of intercultural contact and the wider diffusion of stylistic and ideological norms positioned within these poles.

Fu, Qiaomei (Max Planck Institute for Evolutionary Anthropology), Matthias Meyer (Max Planck Institute for Evolutionary Anthropology), Xing Gao (Institute of Vertebrate Paleontology and Paleoanthropology), Janet Kelso (Max Planck Institute for Evolutionary Anthropology) and Svante Pääbo (Max Planck Institute for Evolutionary Anthropology)
[222] *DNA Analysis of an Early Modern Human from China*

Hominins with morphology similar to present-day humans appear in the fossil record across Eurasia between 40,000 and 50,000 years ago. The genetic relationships between these early modern humans and present-day human populations have not been established. We have extracted DNA from a 40,000-year-old anatomically modern human from Tianyuan Cave outside Beijing, China, and show that it contain less than 0.03% endogenous DNA, making shot-gun sequencing infeasible. We determine the entire non-repetitive sequence of the human chromosome 21 (~ 30 Mbp) using a highly scalable hybridization enrichment strategy, which allows for enriching large fractions of the genome from ancient DNA libraries, and demonstrate its effectiveness. These data as well as the mitochondrial genome sequence reveal that the Tianyuan individual derived from a population that is ancestral to many present-day Asians and Native Americans but postdates the divergence of Asians from Europeans.

Fujita, Masaki [194] see Fukase, Hitoshi

Fukase, Hitoshi (Hokkaido University, Japan)

[194] *Geographic Variation in Skeletal Limb Size and Proportions among Northeast/East Asian Populations*

Body size and shape exhibit considerable variation among human populations globally, which is frequently interpreted in association with climatic conditions. To investigate limb form variation in Northeast/East Asia, we conducted two comparative studies. First, measurements were compared among many pre- and post-historic human groups (e.g. Neolithic Baikalian, Ekven, Buryat, Okhotsk, Ainu, Jomon, and Yayoi people). Results showed that northern Asian groups tended to possess overall larger limb dimensions than groups from Japan. Correlation analysis and principal component analysis also showed the maximum subtrochanteric diameter and the platymeric index to covary with latitude, suggesting that the northern Asians had a wide and flat subtrochanteric shape of the femur. Second, the variation in prehistoric Jomon hunter-gatherers, who inhabited subarctic to subtropical areas in the Japanese archipelago, was examined to evaluate whether or not inter-regional differences follow ecogeographic patterns such as Bergmann's and Allen's rules. Results showed that the Jomon intralimb proportions did not differ significantly among five regions of Japan. In contrast, femoral head breadth (associated with body mass) and skeletal limb lengths were found to be positively correlated with latitude, indicating a north-south geographical cline in the body size. This gradient therefore comprehensively conforms to Bergmann's rule.

[194] *Chair*

Fuller, Benjamin [138] see Johnson, Phillip

Fyfe, Jane (University of Western Australia)

[18] *What's All This Other Art? A Preliminary Report on the Diverse and Distinct Rock Art of*

the Southern Kimberley, Western Australia

The prolific rock art of northern Australia has attracted considerable attention, with research on X-ray art, the Wanjina and Gwion Gwion as widespread as the art itself. In the southern Kimberley, collaborative research with the Bunuba and Gooniyandi peoples, has recorded a large assemblage of distinct and diverse rock art that is little publicized and—until now—never systematically recorded. In a landscape occupied by the Bunuba and Gooniyandi peoples for more than 40,000 years the multiple layers in the rock are important and extant markers of occupation and change. The distribution, motif choice, superimposition, and stylistic elements of the recorded assemblage show differences in the social lifeways of Bunuba and Gooniyandi peoples, including the ways in which identity and belief systems are expressed through the rock art over time and space.

Gabany-Guerrero, Tricia

[237] *Concentric Circles and A/O Signs: Explorations in Purépecha (Michoacán, Mexico) Iconographic Connections to Mesoamerica*

An iconographic research database has been developed to examine the context of specific elements, such as concentric circle and A/O glyphs in the Purépecha region. Specific examples are presented from rock art, ceramics and codices in a discussion of elements from Mesoamerican sources. The poster discussion raises new questions about iconography in Michoacán and challenges ideas about Mesoamerican connections in iconographic symbolism.

[237] *Chair*

Gabany-Guerrero, Tricia [237] see Schreyer, Sandra

Gabany-Gurrero, Tricia [237] see Drozdowski, Jarod

Gabler, Brandon (HDR, Inc.) and Gregory Lockard (HDR, Inc.)

[90] *Lithic Technology during the Transition to Agriculture at the Defense Supply Center Richmond, Chesterfield County, Virginia*

From 2009 to 2012, HDR investigated six archaeological sites with prehistoric components at the Defense Supply Center Richmond in Chesterfield County, Virginia. These excavations produced an abundance of data related to the Late Archaic/Early Woodland occupation of the region. The sites contained lithic and ceramic data that allow us to develop a better image of Archaic and Woodland life in the transition zone between the Piedmont and Coastal Plain. Several of the sites are similar in the proportions of various lithic raw materials, tool types, debitage sizes, and therefore overall lithic reduction strategies. Each site has various characteristics separating it from the others, however, highlighting different functions in close proximity at similar times in the past. Primary core reduction occurred along the bank of Kingsland Creek, whereas tool production occurred farther from the creek on higher-elevation terraces. Abundance of early ceramic sherds is widely variable, suggesting these sites were likely occupied during the transition to agriculture in the region. All but one of the sites were short-term multi- or single-purpose lithic reduction and/or tool production locales. The exception is a site clearly occupied for a longer duration and on a more permanent basis.

Gabriel, Hugo (UBA-CONICET (Argentina), Associated Researcher, NMNH, Smithsonian Institution, Washington, D.C.)

[196] *Actualistic Observations on Some Non-Flint Like Materials from Southern South America*

Historically, lithic analyses were based on the attributes and characteristics on artifacts derived from flint-like materials. However, during the last decades, emphasis has been put on

another rocks used for manufacturing stones tools; among other, quartzite, quartz and other rocks with diverse fractures. Over the years, a number of experiments using varied flaking techniques and strategies were conducted in Southern South America. In this endeavor, diverse non flint-like materials were used to replicate varied core and bifacial reduction strategies. Among others, diverse rhyolites, black volcanic rocks and quartz were flaked. The experimental observations allowed observing that several show subtle but different flaking qualities as well formal macroscopic attributes on the resulting products and by-products. In this communication, I will present and discuss some flaking qualities and attributes observed on some non-flint-like materials from the southern cone of South America.

Gabunia, Manana [226] see Varoutsikos, Bastien

Gade, Susan [92] see Marcucci, Derrick

Gaines, Edmund (Arktikos)

[85] *The Formby Site: A Clovis Site in the Sonoran Desert of Southern Arizona*
Located 50 km southwest of Tucson, Arizona, the Formby site was first reported in 1982 as the find location of two isolated fluted point basal fragments. Recent investigations at the site documented an additional fluted point mid-section, a spurred endscraper of the type commonly found in Clovis assemblages, large bifacial thinning flakes of high-quality, exotic lithic materials, and fossilized large mammal dental remains. These recent finds indicate a true Clovis occupation of the site, as opposed to an isolated fluted point location. Radiocarbon dating of alluvial deposits demonstrates the preservation of late Quaternary stratigraphy and potential for intact Paleoindian deposits. The Formby site represents a significant addition to the growing body of evidence of the Clovis occupation of the Sonoran desert, both in southern Arizona and across the border in northern Mexico.

Gakuhari, Takashi [138] see Yoneda, Minoru

Galipaud, Jean Christophe [219] see Buckley, Hallie

Gallaga, Emiliano (Delegado Federal del Centro INAH, Chiapas Museo Regional De Chiapas)

[252] *"Turquoise Passing by": Blue Items from the Onavas Valley, Sonora, Mexico*
In the Onavas Valley, Sonora, Mexico, in the middle Yaqui River area, several pieces of light green to an intense green or blue color material were found during a survey conducted there in 2004. These items, composed of worked pieces (beads and pendants) and raw material, were at the time identified visually as turquoise. The source of this material was unknown back then and supposed to be from the American Southwest, though it must be recognized that certain sources of turquoise (untested until now) exist in Sonora, which may have been exploited in pre-Hispanic times as well. This presentation aims to present new research in the matter of turquoise identification, possible sources of the Onavas Valley turquoise pieces and the potential far-reaching implications of these results.

[252] *Chair*

Gallardo, Francisco [217] see Pestle, William

Gallis, Erica (George Mason University)

[234] *Hieroglyphic Writing on Maya Ceramic Vessels in the Collections of the Smithsonian Institution's National Museum of the American Indian*

Nearly four dozen Classic Period Maya ceramic vessels in the collections of the National Museum of the American Indian contain previously un-translated hieroglyphs. Interim results of a survey of the artifacts will be presented, in which the glyphs are being interpreted using J. Eric S. Thompson's system of T-numbers. Nearly one dozen objects have evidence of the Primary Standard Sequence, which describes what their contents, purpose, and shape were, and who their owner was. Secondary texts describe painted or carved scenes. The majority of the glyphs appear singularly or in an unknown context (e.g. on sherds or fragments), and as such may contribute to glyph studies outside of the typical Primary and Secondary contexts. The vessels were discovered primarily in Campeche, Mexico; Petén, Guatemala; and Cayo, Belize and, therefore, will say the most about those regions.

Gallon, Matthew (University of Michigan)

[101] *Urbanization and the Construction of Religious Identities in Mid-First Millennium C.E. Central Thailand*

The dramatic increases in the population sizes of emerging urban centers often overwhelmed traditional kinship-based mechanisms for maintaining social cohesion and group identity. In their place a new set of relationships and identities were needed to help unite the residents of urban centers who did not have strong kinship ties, and in some cases had significant cultural differences. During the mid-first millennium C.E., the Dvaravati culture of central Thailand faced these challenges as they underwent urbanization and increasing political centralization. This paper examines how the Dvaravati relied on religious traditions from South Asia, including different sects of Hinduism and Buddhism, to define new identities and relationships within their society. Religious monuments played a key role in this process both by reinforcing group membership during their construction and use, and by physically defining space within the settlement according to these new emerging identities. Additionally, variation in the type and location of religious monuments reveals how different groups within Dvaravati society, such as political elites and the monastic order, relied on religious identities in different ways as they met the challenges and opportunities associated with increasing urbanization.

Gallone, Anna [105] see Opitz, Rachel

Gallow, Lauren (University of California, Santa Barbara) and Deborah Spivak (University of California, Santa Barbara)

[19] *Alternative Style: Abstraction in Loro Ceramics of the Middle Horizon South Coast*

The Nasca ceramic style of the Peruvian south coast witnessed a notable shift in the Middle Horizon when the Early Intermediate Period finely crafted polychrome vessels and naturalistic motifs gave way to the thicker and less polished ware with enigmatic designs of the Loro style. Loro ceramics are often considered a degeneration of the Nasca style, an indirect result of the advancement of the Wari empire, its establishment of imperial centers, and its ideological and economic influence on the local culture. The producers of the Loro style, however, distanced themselves from the Wari, moving away from the region of direct Wari contact and maintaining elements of the EIP Nasca lifeways. This paper approaches the Loro style from the perspective of local resistance to imperial pictorial ideology. Loro motifs reflect a new way of meaning that eschewed the representational in favor of the abstracted. By examining the ways in which the Loro style operated as a system of abridgement and schematization, I argue that the Loro style was deliberately less accessible to a broad audience, enforcing a local identity through a shared visual language.

Galop, Didier [144] see Arnauld, Charlotte

Galvin, Kathleen (Colorado State University)

[23]

Linking Decision-Making to Ecosystem Services: Using an Integrated Modeling Approach

Our team has developed an agent-based household model and coupled it to an ecological model for use in the world's drylands. With use of the coupled model we can address the effects of globalization through changes in land tenure, land use, policy and climate for both the economy and ecosystem services important to people. With field data from Kenya, model results show unintended consequences of land use change. Modeling loss of access to part of the rangelands to large-scale cultivation showed that local herders increased livestock sales to make up for lower food security. Surprisingly, more distant households showed no change or had increases in their livestock populations because their herds had fewer animals to compete with. The principle benefit of the linked model is its ability to link household decision making to local ecosystem services and thereby take into account the ecological and economic costs of decisions. As dryland landscapes change it is more difficult for people to acquire the resources they need, with the result that both their well-being and the resilience of the environment are diminished. What seems to be economically rational in the short run often has a long-term negative effect on the environment and economy.

Gandara, Manuel (ENCRYM/INAH-Mexico)

[221] *Heritage Interpretation as a Conservation Tool in Mexican Archaeology: Theory and Practice*
Faced with an enormous archaeological heritage, Mexico has great challenge: more than a million archaeological sites and less than 1,000 practicing archaeologists in the country. Neither the immediate increase in the number of individual practitioners nor in the number or power of official institutions will help this predicament. According to a high level official at INAH, we lose an archaeological site every two weeks, and there are events, like the flooding of a hydro electrical dam, can destroy hundreds of sites at once. An alternative approach is to involve the citizens, who are the real owners of our heritage, in its conservation. A strategy to accomplish this aim is being developed in Mexico; it is being incipiently used at some well-known sites and in the design of new site museums. It is a variant of heritage interpretation, the kind that has been used with success in the United States, England, Australia and other countries; but the approach has been developed with the specific context of our country in mind and hence it has a definitely Mexican orientation. In the paper we will present the broad outline of the theory and some of the early results.

Gandolfi, Eleonora (University of Southampton), Graeme Earl (University of Southampton) and Simon Keay (University of Southampton)

[265] *Navigating Portus: Virtual Access to Archaeological Sites*

Visual communication tools are increasingly being employed in archaeology to convey a message between a subject and a target. The visual communication process is not limited only to static images; it also explores the concept of 'presence' and interaction connected with virtual environments. This poster describes a pilot study to estimate the viability and the application of cutting-edge location aware computing technologies to interconnect physical heritage and the interpreted past. The study will be using the Roman site of Portus, Italy as example and it will focus on the building that has been tentatively identified as being involved in ship repairs.

The maritime port of Imperial Rome encloses an area of 69 hectares and has been only partially excavated under the Portus Project (www.portusproject.org).

The site has been considerably modified since its construction in the first century AD and part of it has been integrated into the modern urban town of Fiumicino. Despite its importance and position, the site is not currently easily accessible to tourists. The poster examines whether such an approach can make Portus and

other sites more appealing to visitors and the general public, by providing imagery that they can relate to and engage with.

Gangloff, Deborah

[110] *Archaeological Advocacy: Making the Economic Case for Cultural Resources*

The U.S. has an enviable volume and diversity of public lands that are held in trust for all Americans. Some believe that our public lands should be preserved for their scenic beauty, ecological assets, and cultural and natural resources. Others believe that resources, specifically energy reserves, must be exploited. The economic recession rocking our economy has only served to heighten this divide, with jobs and local economies hanging in the balance. It is the responsibility of archaeologists to contribute their perspective on this national public policy debate. Cultural resources are nonrenewable and can be damaged by extractive development. Cultural heritage tourism economies built on travel expenditures (a \$759 billion business in America) can begin to help archaeologists place a value on the preservation of historic sites. For nonprofit organizations, advocacy is not just a right, but a responsibility. Policy makers need data on which to base their decisions. Providing them with objective, independent research to make the economic case for cultural resources and historic preservation can make the difference between bad and better public policy. Advocacy efforts can also ensure that organizations remain relevant to their constituencies and to the most important issues of the day.

Gann, Douglas (Archaeology Southwest)

[110] *Strategies for Public Outreach in Preservation Archaeology*

Preservation Archaeology ensures meaningful understanding and perpetuation of the archaeological record through active research, site conservation, and public outreach. Broadly sharing information about the past engages people in efforts to value and protect archaeological remains. Although social media facilitate outreach, data on the relative effectiveness of these technologies remain elusive. Archaeology Southwest's public outreach strategy employs a wide range of media, including traditional print publications, science cafés, streaming video, electronic newsletters, and a blog, in order to leverage, rather than depend upon, social media. Looking to the future, Archaeology Southwest is exploring three-dimensional gaming environments that can impart information in formats that meet the sophisticated expectations of 21st century audiences. By building upon tools developed for multiple-user virtual simulation games, Archaeology Southwest will enable people to situate themselves in the places of the past, fostering a better understanding of in-situ human histories and the merits of preservation.

Gao, Xing [222] see Fu, Qiaomei

Garcea, Elena (University of Cassino and Southern Latium)

[225] *Pushing Non-Pastoral Boundaries: Relationships between Pastoralists and Non-Pastoralists in Upper Nubia, Sudan*

During the early Holocene, groups of hunter-fisher-gatherers, associated with the Khartoum Variant techno-complex, settled in Nubia. The shift to cattle herding started around 7200 B.C. at Wadi el-Arab near Kerma. This date is only slightly later than the domestic cattle remains from Nabta Playa, in the Egyptian Western Desert. However, the adoption of pastoralism was not contemporary in the entire region. The techno-complex associated with pastoralism in Nubia was named Abkan and dated from around 5000 B.C. This age is coherent with the evidence from Sai Island, ca. 110 km north of Wadi el-Arab, where the Khartoum Variant unit lasted until at least 5000 B.C., suggesting that non-pastoral groups continued to exist after pastoralism had been introduced in the region. In order to understand the relationships

between pastoral and non-pastoral groups, a stratified site can best address this question. My recent excavation of Site 8-B-76 at Sai Island provided a sequence with Abkan and Khartoum Variant occupations. This paper will investigate not only the relationships between pastoral and non-pastoral groups, but also the reasons why different groups could select the same sites for their settlements and keep them as base camps under different cultural, economic and organizational circumstances.

Garcia, Santiago (Rio Hondo College, Division of Behavioral and Social Sciences)

- [126] *The Venus Star and the Avian Serpent: Remnants of a Regional Cult in Early Formative Mesoamerica*

Most Mesoamericanists suspect that clay figurines represent small-scale replicas of individual and group status and identity. Consequently, figurines along with other portable ceramics are important to understanding early complex behavior and local and non-local interaction. This paper presents the results of first efforts to identify and collect examples of the so-called Venus Star (Blomster 2002) appearing recently in Early Formative (1250–900 B.C.) contexts, mainly on fragmented clay figurines and pottery made in the Olmec style. The presence of the Venus Star placed alongside the Avian Serpent on pottery, although rare, reveals that the pair might have materialized emerging beliefs, values, and worldview; remnants of a regional cult in Early Formative Mesoamerica. These data, discussed elsewhere as cult ceramics (see Blomster 1998, 2002, 2010; Garcia 2011), suggests that religious proselytizing involved much more than ancestral veneration, worship, and ceremony/ritual; but also long-distance travel, cooperation, dialogue, and tolerance, for purposes of building alliances, body healing, teaching, and growing intellectually; in other words, building emotional intelligence.

Garcia, Dante (Zona Arqueologica de Monte Albán)

- [159] *La cerámica tardía de Monte Albán en la relación mixteco-zapoteca del Valle de Oaxaca*
A 80 años del descubrimiento de la Tumba 7, se cuenta con nuevos hallazgos y evidencias de las ocupaciones tardías en Monte Albán. Una nueva revisión de los informes de Caso y la contrastación de la información presentada en informes y publicaciones de excavaciones y recorridos de superficie realizados desde 1932 hasta la fecha en todo el perímetro de Monte Albán, nos ha permitido identificar áreas con ocupación tardía, patrones de uso y distribución de cerámicas tardías, así como áreas de asentamientos de afiliación mixteca. Información que nos permite dar una nueva mirada a la relación de las culturas mixteca y zapoteca en Monte Albán.

García, Juan [26] see Méndez Melgar, César

Garcia Sanchez, Magdalena (El Colegio de Michoacán)

- [107] *"Metatología". De cómo y cuándo se usan metates y molcajetes. Una mirada desde la etnografía arqueológica*

Los metates y los molcajetes son instrumentos para la molienda, muy frecuentes entre los materiales arqueológicos dada la materia prima con la que fueron elaborados: la piedra. Abundan sobre todo en los contextos que proceden de unidades domésticas. Si bien son fácilmente reconocibles por sus formas, los metates rectangulares con o sin soportes, los molcajetes de forma circular cóncava asimismo con o sin soportes, analizados con detenimiento dan cuenta de una amplia diversidad en tamaños, gruesos, inclinaciones o profundidades. Esta diversidad dio pie para hacerse las preguntas: ¿a qué se debe esta diversidad? ¿con qué criterios están relacionados?

Es objetivo de este trabajo presentar los avances de una investigación que intenta responder a éstas y otras cuestiones en relación con el uso de estos instrumentos para la molienda, así como proponer algunas analogías que sirvan de apoyo a la investigación arqueológica.

García Uranga, Baudelina [252] see Medina González, José

Garcia-Des Lauriers, Claudia (California State Polytechnic University, Pomona)

- [63] *Teotihuacan and Los Horcones: Reconstructing Interaction Networks in Southeastern Mesoamerican during the Early Classic*

Recent research at the site of Los Horcones, Chiapas has revealed an important history of contacts between Teotihuacan and the Pacific coastal region of Mesoamerica. Investigations at this site are adding to an already important corpus of materials from the Escuintla region of Guatemala from sites such as Balberta and Montana conducted by Fred Bove, Sonia Medrano and others. In this paper, I will look at the history of these contacts and at the evidence currently available from sites on the coast to reconstruct the networks of interaction during the Early Classic. In addition, we will look at the important role Los Horcones played in these networks and the legacy of Teotihuacan's presence in the area.

- [63] *Chair*

Garcia-Tuck, Patricia (Agua Caliente Band of Cahuilla Indians)

- [174] *Chair*

Gardeisen, Armelle [83] see Vaiglova, Petra

Gardela, Leszek (Snorrastofa, Reykholt, Iceland)

- [55] *"Deviant Burials" of the Viking Age: A Critical Perspective*

Archaeologists are well aware of the amazing diversity of funerary practices in late Iron Age Scandinavia and many interpretations of the internal and external compositions of Viking-Age graves have been proposed so far. Until recently, however, very little scholarly attention has been devoted to the study and understanding of those funerary practices that involved a reopening of graves, mutilation of bodies, pre- or post-mortem decapitation, interments in a prone position or covering of the deceased with stones. In European Early Medieval archaeology, graves that contained traces of such rites have often been labeled "atypical" or "deviant" and it has been frequently argued that they held negative connotations. The aim of this paper is to critically examine the meanings that may have stood behind "atypical" burial practices in the Viking-Age context. With the employment of Old Norse textual sources and archaeological evidence from different areas of the Viking diaspora, particular emphasis will be placed on the multi-stage performances that these "deviant burials" may have involved – both at home and at the graveside. An important question will be posed whether such "deviant burials" signaled only negative approaches to the deceased or whether they may have communicated ambivalent emotions of the mourners.

Gardner, A. Dudley (Western Wyoming College) and William Gardner (Yale University)

- [128] *A Look at the Transition from the Formative Period to the Protohistoric Period in the Upper Colorado River Drainage Basin*

It is generally accepted that, around 500 to 600 BP, the horticulturalists of northwestern Colorado experienced a dramatic shift in their economic strategy from horticulture to one centered on hunting and gathering. This transition did not necessarily result in the creation of a new tool kit or technologies, but it did lead to subtle alterations. Here, we examine what we have learned from excavations at stratified sites in northwestern Colorado. Specifically, we will discuss changes in diet and technologies that point to subtle variances in material culture assemblages.

Gardner, William [128] see Gardner, A. Dudley

Garner, Nancy (University of West Georgia)

- [81] *Trade and Alliance: Change in Political Power at Apalachicola, a Lower Creek Town*
 Trade between Europeans and Native Americans was a complex arrangement that became the dominant economic system among the Creek Indians. The town of Apalachicola, an important center for the Lower Creek, enjoyed a rich tradition of trade with Europeans. As part of a larger project, Apalachicola Ecosystems Project, excavations revealed a vast array of historic-period trade goods. This paper examines historical documents and material remains to track political and economic alliances and their change over time at Apalachicola and in the surrounding area.

[81] *Chair*

Garrido, Francisco (University of Pittsburgh), Tao Li (Ph.D. student, University of Pittsburgh), Dong Li (Ph.D. student, University of Pittsburgh) and Wugan Luo (Graduate University of Chinese Academy of Sciences)

- [202] *Mining Camps and Economic Strategies in the Atacama Desert during the Inca Times*

Although a main interest in the Inca conquest of the southern Atacama region was focused on metallurgic production, it is possible to find the presence of local dynamics of mining following central place foraging models for bead and pigment production. These dynamics were driven by corporate groups working in activity camps that evidence some degrees of specialization and internal differentiation. These groups developed their own processes of social complexity fostered by the Inca presence in the area and the differential political integration of local groups within the power relationships of the Empire.

Garrido, Francisco [202] see Li, Tao

Garrison, Thomas (University of Southern California)

- [21] *Los Bajeros: Rural Ancient Maya at Xultun and El Zotz*

The Department of the Petén, Guatemala presents a diverse array of environments to which the ancient Maya adapted. The areas between the major site centers are where the rural population settled, often on the margins of large seasonal swamps, or bajos. These bajeros were constantly modifying the landscape and readapting to the resultant environmental changes over hundreds of years. To a certain degree these farmers were also affected by the geopolitical consequences of the actions of local royal courts. This paper examines two case studies from disparate areas of the Maya lowlands. In the Xultun rural periphery there is a pattern of punctuated occupation focused on exploitation of abundant chert resources and large bajos. In the El Zotz rural periphery there is a constant occupation that shifts across the landscape through time. This comparative study will highlight true regional differences in Maya settlement patterns and offer some possible explanations for ancient population fluctuations and movements.

Garvie-Lok, Sandra [79] see Leslie, Brian

Gasco, Janine (CSU-Dominguez Hills)

- [140] *Settlement and Economy in a Postclassic Rural Community in the Soconusco Region, Chiapas, Mexico*

Recent research at the Postclassic site of Gonzalo Hernández, Chiapas, Mexico, indicates that this was a small, disperse rural community, a category of site that is rarely the focus of archaeological research in Mesoamerica. Data from excavations and extensive surface collections at Gonzalo Hernández provide

an opportunity to explore how this community was organized spatially, the extent to which its residents participated in the expanding commercial economy of the Postclassic period, and variability across the community with regard to consumption and activity patterns. The data also allow for comparisons between patterns at this site and patterns at other Postclassic sites in the Soconusco and other regions of Mesoamerica. The Postclassic occupation of Gonzalo Hernández covers over 30 hectares, yet there are only 16 small mounds, all under one meter in elevation and most under 50cm. Dense occupational debris from surface collections across the site—not just near mounds—demonstrates that many houses were constructed at ground level, a factor that has contributed to underreporting of Postclassic sites in the Soconusco region previously. The analysis of the distribution of obsidian and other imported materials will help us to identify economic patterns and variable consumption and activity patterns across the site.

Gasparyan, Boris [208] see Martirosyan - Olshansky, Kristine

Gates St-Pierre, Christian (Université Laval, Quebec City) and Robert Thompson (University of Minnesota)

- [217] *Phytolith Evidence of Maize Consumption during the Middle Woodland Period in Southern Quebec*

This paper presents the results of the analysis of carbonized encrustations on proto-Iroquoian vessels dating from the Middle Woodland period (400 BC to 1000 AD). The samples were selected among the ceramic collections of the Hector-Trudel and Station-4 sites located in Pointe-du-Buisson, near Montreal, and the Place-Royale site in Quebec City. The phytolith analyses and radiocarbon dating lead to the identification of the oldest evidence of maize consumption in the St. Lawrence River Valley at about 400 to 200 BC (early Middle Woodland period), indicating that the adoption of agriculture happened much earlier than previously thought is this region. This is the northernmost evidence of maize consumption in the Northeast. The results also contribute to a better understanding of the prehistoric foodways of the proto-Iroquoian populations of the Middle Woodland period.

Gates-Foster, Jennifer (University of Texas at Austin)

- [56] *Think Local, Buy Local: Pottery Supply and Consumption in the Ptolemaic Eastern Desert, Egypt*

Archaeological surveys conducted in the Eastern Desert of Egypt by Henry T. Wright, have, along with the contributions of other scholars, revolutionized our knowledge of settlement patterns in this region, once thought to sit at the margins of Egyptian society and economy. This survey work in the area between the Nile Valley and the Red Sea has instead demonstrated the enormous degree to which these networks were dependent upon and integrated with the economic and political systems anchored in the Nile Valley. The assemblage of pottery associated with Ptolemaic (4th-1st c. BCE) occupation in the region is no exception as it reveals a web of supply that firmly associates the Eastern Desert during this period with the pottery production of Upper Egypt, especially of the Aswan and Theban spheres. Comparison with supply networks for the Eastern Desert documented in the Roman era make clear the fundamental changes which occurred after the Roman conquest from the perspective of local production networks and the consumption of pottery on a regional scale.

Gatsov, Ivan [90] see Nedelcheva, Petranka

Gauthier, Nicolas (Boston University)

- [58] *Quantifying the Spatial Distribution of Archaeological Sediments in Thin Section*

The study of intact sediments at the microscopic level in thin

section provides a rare glimpse of the geogenic and anthropogenic materials in excavations as they appeared in situ. Micromorphologists employ a standard terminology for describing thin sections based on visual estimation of relevant features. While this method is useful for identifying those microscopic features, it is sub-optimal for quantifying spatial attributes - such as distribution and orientation - that are necessary for understanding complex occupation deposits with many poorly differentiated strata. The dearth of quantification makes micromorphological data both difficult to falsify without access to the original samples and overly dependent on the experience level of the operator. This study attempts to provide greater objectivity to micromorphological data by using geospatial technologies generally reserved for processing phenomena on a much larger scale. Photomicrographs of thin sections were reclassified using multispectral remote sensing techniques and converted into topological vector file for importation into a GIS environment. This facilitated the development of a spatial database, providing both an intuitive means for structuring traditional descriptions as well as a basis for more complex spatial analyses.

Gauthier, Gilles and Adrian L. Burke

[62] *Adapting XRF Protocols for the Geochemical Characterization of Archaeological Materials*
X-ray fluorescence spectrometry (XRF) has been a standard technique in geology for the geochemical analysis of rocks for over 60 years. It is now a common technique used in the chemical characterization of archaeological materials. Specific protocols have been developed in the archaeological XRF lab at Universite de Montreal for the non-destructive and destructive geochemical characterization of rocks and rock type determination that take into consideration the effects of weathering on archaeological samples. The use of internationally certified reference materials or standards is at the heart of our approach which focuses on precision, accuracy and limits of detection as essential to the development of robust XRF techniques for archaeological materials analysis. We present XRF data on igneous, metamorphic and sedimentary rocks used in the past to make stone tools. Precision and limits of detection vary according to the chemical elements measured which are also influenced by the rock type namely by the crystalline structure and silica content. XRF is a proven and reliable technique in the analysis (non-destructive and destructive) of igneous rocks such as obsidian or rhyolite. The challenges are greater with rocks that are very high in silicon (quartzites) and contain a wide variety of elements (cherts).

Gauthier, Gilles [229] see Burke, Adrian

Gay, Ebenezer [189] see Smith, Kevin

Gaydarska, Bisserka [15] see Chapman, John

Gearty, Erin (Northern Arizona University)

[139] *We Are What We Weave: Identity Expressed through Basketmaker II Textiles and Sandals*
My thesis research investigates the ethnic identity of the earliest agriculturalists on the Colorado Plateau. I do so by examining how people could have conveyed identity through material culture, namely textiles and sandals. Archaeologists refer to the earliest farmers on the Colorado Plateau as Basketmaker II peoples. Recent research has shown that Basketmaker II material culture across the Colorado Plateau is both similar and diverse (Bryce 2010; Charles and Cole 2006; Matson 2006; Robbins 1997; Webster and Hays-Gilpin 1994). I analyze woven materials from Basketmaker II rockshelter sites on the Colorado Plateau to identify the ways in which Basketmaker II textiles and sandals differ regionally. Specifically, I examine woven materials from the Grand Gulch, Comb Ridge, Canyon del Muerto, Glen Canyon, and Black Mesa areas to identify whether multiple ethnicities could

have existed within the Basketmaker II time period.

Gener, Marc [95] see Cruz Berrocal, Maria

Gentil, Bianca (California State University Northridge) and Brandon Lewis (Santa Monica College and Register of Professional)

[197] *The Realm of the Sacred at La Milpa: Materializations of Ideology*

The role of ideology in the development of political complexity has received considerable intellectual debate. Ongoing excavations at the site of La Milpa in northwestern Belize examine the degree to which ideology was strategically employed as a tool of elite manipulation and social explanation. As part of the overarching Three Rivers Archaeological Project, we have focused considerable attention on the extended lineages associated with La Milpa's ruling elite. We will present data on the materialization of ideology at La Milpa, commenting on the role of site planning, sacred architecture/space, and material possessions within the development of this eastern Peten site. This data will be evaluated against the various theoretical models used to explain the role of ideology in the furthering of social complexity.

Geraci, Peter (ISAS/UWM-Milwaukee)

[54] *Woodland Adaptations to Upland Settings in Northeastern Illinois: New Data from the Kautz Site (11DU1)*

The multiple shifts seen in subsistence, settlement, mortuary practices and political economy among regions across the Upper Mid-continent United States between the Middle to Late Woodland periods has puzzled archaeologists for decades. Until recently, the Hopewell Exchange System, centered in Ohio and west-central Illinois, appeared to have connected disparate groups across the eastern U.S. for nearly three centuries. As it faded from the archaeological record circa A.D. 300-400 it was replaced in different regions with populations who were less connected, but who shared broadly similar cultural patterns. The Kautz site (11DU1) represents an opportunity to explore the Middle and Late Woodland behavior in the remote uplands of northeastern Illinois away from major southern population centers. A recent analysis of these materials suggests that people at Kautz shared a similar material culture and world view with their neighbors, but retained many localized cultural patterns that can be seen in the archaeological record as far back as the Late Archaic, circa 1000 B.C. This paper will illuminate these differences and how the people at the Kautz site were practicing a lifeway specifically adapted to the upland moraines of northeastern Illinois.

Germon Roche, Mauricio [78] see Ringle, William

Germonpré, Mietje [20] see Thalmann, Olaf

Gerrish, Tim [276] see Cooper, Jason

Gerth, Ellen (Odyssey Marine Exploration)

[125] *The Tortugas Shipwreck Project, Florida Keys: Pioneering Deep-Sea Technology and its Contribution to Historical Archaeology*

In 1989 Seahawk Deep-Ocean Technology of Tampa, Florida, discovered a colonial-era shipwreck 400 meters deep off the Dry Tortugas islands in the Florida Keys. Throughout 1990 and 1991 the site's entire archaeological assemblages were recorded and recovered, exclusively using pioneering robotic technology developed around a Remotely-Operated Vehicle (ROV).

The 16,903 artifacts recovered from the site so closely match by date and type the assemblages associated with the wrecks of the

Atocha and Margarita that this ship indisputably sailed with the ill-fated 1622 Tierra Firme fleet. This ground-breaking archaeological project, the world's first robotic shipwreck excavation, produced in both volume and variety, an artifact assemblage unparalleled amongst other 16th and 17th-century Spanish shipwrecks worldwide.

After 20 years of research, the results of the Tortugas excavation will be published in 2012. This paper will demonstrate how the application of new technology enabled a cross-section of artifacts – from large olive jars, astrolabes and gold bars to pearls, beads and animal bones – to be safely recovered, permitting opportunities to draw analogies with comparative assemblages, while writing a new chapter in the historical archaeology of a small, early 17th-century 'merchant vessel sailing at the end of the Golden Age of Spain.

Giambastiani, Mark

[128] *Right in Thomas' Backyard: Prehistoric Archaeology of the Northern Monitor Range, Central Nevada*

In 2010-2011, archaeologists from ASM Affiliates, Inc. completed a nearly 10,000-acre inventory of high elevation, upland, and pinyon-juniper woodland zones in the northern Monitor Range. The documentation of more than 500 archaeological sites and compilation of detailed survey data generated a wealth of information regarding prehistoric adaptations and an important dataset for comparisons against the results of D. H. Thomas' pinyon and lowland surveys in adjacent Monitor Valley and nearby Reese River Valley. Identified diagnostic artifacts also testify to a much longer span of prehistoric occupation than was documented in Thomas' study areas.

Gibbs, Kevin (University of Aberdeen)

[258] *Chair*

Gibbs, Kevin [258] see Isaksson, Sven

Gibson, Kathleen (University of Texas-Houston)

[11] *Interpreting Archaeological Evidence for Language Evolution*

Paleolithic bones and archaeological imprints provide clues to the evolution of language, but competing models of human cognitive, linguistic and neural evolution confound interpretations of these clues. A review of several conflicting models indicates that no single piece of archaeological evidence, or lack thereof, can conclusively prove the presence or absence of language. Taken as a whole, however, increases in brain size and tool complexity indicate similar increases in the hierarchical construction capacities essential for syntactic language. Hafted tools and other objects constructed from diverse components signify the presence of hierarchical abilities far in excess of that possessed by apes. The combined evidence of hafting, modern hyoid bones, modern brain sizes, and modern ear structures strongly suggests that both Neandertals and early modern humans possessed the cognitive and vocal capacities necessary for language.

Gibson, Rebecca (Brandeis University)

[44] *What a Waist: Examining Dimensions in Victorian Era Corsetry*

From childhood to old age, Victorian women's bodies were bounded and defined by corsets. As the manufacture of clothing grew and changed during the industrialization of England, so corsetry changed from a dubious privilege of the upper classes to the seeming responsibility of all women, rich or poor. With this change came the need for corsets to be more flexible in their

dimensions, so as not to impede the working ability of the lower classes. Much of the research done on the dimensions of corsets has focused on advertisements and what seems to be promised by them—the reduction of the waist by a certain number of inches. This paper will focus instead on the physical properties of the corsets themselves, the circumference of the waist, bust, and hips, and the strength or flexibility of the materials used in creating the garment. This paper proposes a look at the waists of women in Victorian England, through careful examination of museum collected data pertaining to certain extant corsets held in the Victoria and Albert museum in London, and the Bath Fashion Museum in the city of Bath.

[44] *Chair*

Gibson, Heather (AECOM)

[102] *Death and Dying in 19th-Century Los Angeles: Mortuary Archaeology at Two Historic Cemeteries*

Recent excavations at two 19th-century Los Angeles cemeteries, Los Angeles Plaza Church Cemetery (circa 1822-1844) and Los Angeles City Cemetery (circa 1853-1890) open up several interesting avenues of inquiry with regard to the city's religious, social, and economic history. Burial practices and material culture recovered from the mortuary features at these two cemeteries reflect the changing religious and ethnic makeup of the pueblo and later the city of Los Angeles, as well as a drastic transformation in availability of goods and networks of trade. Comparisons between the artifact assemblages from Mission period Los Angeles Plaza Church Cemetery and American period City Cemetery speak to the shift from a predominantly Catholic population to a more diverse religious makeup including an influx of Anglo Protestants, the increased availability of mass produced goods, the importance of the arrival of the railroad in shaping the local and regional market, and the growing influence of mass consumption on all aspects of life, including death. This paper compares the material assemblages of the two cemeteries and relates them to broader social, cultural, religious, and economic forces shaping 19th-century California.

Gibson, D (El Camino College)

[242] *Chalcolithic Chiefdoms? Evaluation of the Evidence from County Clare, Ireland*

Very complex chiefdoms are well known at the dawn of the historical period in Ireland, and a good case can be made for the existence of chiefdoms during the Iron Age and Late Bronze Age, as well. However, those archaeologists who have evaluated the evidence for the Chalcolithic and Early Bronze Age feel that segmentary lineages of equivalent social stature prevailed during this time period. A long-running program of analysis carried out upon the finds from a habitation site in the Burren region of Co. Clare has turned up evidence that copper smelting was carried out there using imported ore. These facts and others call into question the premise of acephalous political systems during the earliest metal ages.

[242] *Chair*

Giesler, Kalena (University of Southern California), Parin Patel (University of Southern California), Sarah Butler (University of Southern California), Paul Salay (University of Southern California) and Lynn Swartz Dodd (University of Southern California)

[48] *ARC You Smarter Than a Sixth Grader? Promoting Archaeology through Educational Outreach*

Educational outreach is necessary to engage the public in the investigation, understanding, and preservation of the past. This paper seeks to analyze the effectiveness of the ARC Smart Community Service Initiative, an outreach program designed to educate elementary school students about the field of

archaeology, as well as to prepare students with critical thinking skills. ARC Smart also serves as a curriculum enrichment program for the Grade Six California Content Standards in Social Studies Exam. The program is a partnership between the Los Angeles Unified School District and the University of Southern California Archaeology Research Center. In sessions that include simulated excavations, virtual tours of archaeological sites, artifact handling, and an interactive archaeological database pioneered by USC, undergraduate volunteers provide sixth graders with the opportunity to explore ancient civilizations throughout the world. These sessions engage students in a hands-on learning process and allow them to understand the importance of conservation by comparing modern societies to those of the past. The results from assessments taken before and after the program show significant growth in learning and clear retention rates amongst the students. Interactive programs such as ARC Smart can create a bridge between archaeologists and the public.

[48] *Chair*

Gijanto, Liza [178] see Woodburn, Michael

Gijanto, Liza (St. Mary's College of Maryland)

[261] *Supporting the Fort: Viewing the British Commercial Landscape from James Island, The Gambia*

This paper explores the role of the "fort" in the context of the Gambia River as British trading companies attempted to dominate trade beginning in the 17th century. In doing so, traders altered the region's socio-economic landscape from one geared toward the inland trade, to a realignment toward the Atlantic. Central to these efforts at reorienting regional trade and exchange was the British fort on James Island. Strategically important near the entrance of the river, as well as in sight of the French Albreda on the mainland, the defense of the river provided by fortifications on James Island remained vital to Britain's commerce into the early 19th century. However, the physical nature of the island including limited space and the lack of a fresh water source required that the trading companies maintain nearby support posts. These locales such as Juffure became commercial centers, while others like San Domingo served as filling stations for water, foodstuffs, and wood. By examining the socio-economic interactions, access to wealth, and demographic shifts tied to British commerce during the Atlantic era, experiences of the residents of Juffure and San Domingo in terms of their relationship to British activities at the James Island fort are explored.

Gilbert, William (Human Evolution Studies Laboratory, CSU East Bay)

[10] *Multi-institution Specimen Metabases and Priority*

Many have envisioned global paleoanthropology meta(data)bases, but, while technically feasible, there are logistical, institutional, social, and other hurdles to combining and serving data from several source institutions. At the forefront is priority. Non-traditional dissemination of information hasn't been afforded high status by review committees, diminishing individual incentive. Additionally, institutions are hesitant to invest time in extra-institutional initiatives with ambiguous returns. In spite of these difficulties, databases now constitute valid publication media, and many multi-institution metabases exist. Some of the lessons learned from these efforts are applicable across disciplines. One such effort, the FOROST metabase (www.forost.org), searches specimens in worldwide forensic osteology collections. Photos, descriptions, diagnoses and life records are the intellectual property of the owning institution. When FOROST-derived material is published, owning institutions, projects, and individuals need to retain priority for the information and images provided. Neither FOROST nor any similar metabase can be cited as prescribed for databases in the MLA and APA guides: At very least, the specimen repository and metabase are essential bibliographic information. Understanding priority and citation has been crucial in

the development of FOROST, and this presentation will elaborate on what we have learned can be applied to the development of prehistory metabases.

Giles, Bretton (CEMML)

[259] *(Em)bodying the Cosmos in the Eastern Woodlands*

I argue that the conceptualization of the human body as a microcosm or mirror for the cosmos may explain why cross motifs were depicted on or adorned various human representations. Cross motifs are often considered world symbols that portray the four cardinal directions. Some cross-shaped designs, depending on the other motifs they incorporated, may depict a vertical axis mundi. These cross motifs also have a long-term connection with the representation of the human body in the Eastern Woodlands. This association extends back to the Middle Woodland period, based on a human effigy pipe portrayed with a swirl-cross from the Edwin Harness Mound. These connections continued to occur during the Mississippian period on headpots from the Central Mississippi River Valley. Cross motifs were also incorporated into a variety of prehistoric ritual regalia during both the Middle Woodland and Mississippian periods. While during the historic period, Dhegihan Sioux people painted analogous cross motifs on the face of adoptees during Calumet rituals. Cross motifs were also used as templates for particular boys' haircuts, styles linked to specific Siouan clans. I also explore the symbolic significance of these relational connections, including their links to children, death, renewal, avian imagery, and other cosmological themes.

Giles, Bretton [264] see Koerner, Shannon

Gill, Timothy

[105] *Mobile Data Entry Using "Codifi" Database Program at Palehua, Hawai'i*

Situated in the uplands of the Wai'anae Mountains on O'ahu island, Hawai'i, a unique stone enclosure and associated features may have served as a ceremonial or aggregation site during annual Makahiki rites. During May 2012 test excavations and mapping were conducted at the site, and much of the data recordation from the excavations was accomplished using an iPad application version of the "Codifi" database program being developed by the Center for Digital Archaeology at UC Berkeley. That program was adapted to the specific recording requirements and forms to be used at the excavations. This paper will report on both the findings from the mapping and excavation, and also on the experience of using the iPad as a means to input data directly into the excavation's database and to work with those data thereafter.

Gillam, Christopher (University of South Carolina (SRARP-SCIAA)), Sergei Gladyshev (Institute of Archaeology and Ethnography, Novosibir), Andrei Tabarev (Institute of Archaeology and Ethnography, Novosibir), B. Gunchinsuren (Institute of Archaeology, Mongolian Academy of Science) and John W. Olsen (Regents' Professor, School of Anthropology, The University of Arizona)

[222] *Modeling Paleolithic Landscapes of Northern Mongolia*

In the past decade, numerous sites (n=36) dating to the Pleistocene and early Holocene have been discovered along the Ikh-Tulberiin-Gol, Kharganyn-Gol, and Altatyn-Gol rivers of the greater Selenge-Gol River Basin, northern Mongolia. Since 2011, a GIS database has been developed to explore the nature of the region's Paleolithic landscapes. Initial results indicate a settlement preference for south- and east-facing slopes with good viewsheds of surrounding terrain. Analysis of local topography identified the location of a significant saddle in the mountainous terrain separating the Ikh-Tulberiin from the Kharganyn and Altatyn rivers. The saddle, still in use by local herders, has archaeological evidence of continued use from at least the early Upper Paleolithic (ca. 40,000 cal. B.P.) to modern times. The Saddle Site also lies

nearly due east and within the viewshed of a previously recorded middle Upper Paleolithic large flake cache ($n = 57$ artifacts; ca. 25,000–15,000 cal. B.P.) that is unique to the region, bringing into focus the locational meaning of this significant cultural feature.

Gillis, Nichole (Public Archaeology Laboratory, Inc.) and Kristen Heiter (Public Archaeology Laboratory, Inc.)

[119] *Knee Deep in Paul Revere's Privy? Archaeology of the Paul Revere Houselot, Boston, Massachusetts*

The Paul Revere houselot is situated in the North End of Boston, one of the oldest English-settled areas of the city. Paul Revere purchased the property in 1770 and lived there with his family from 1770–1780. Today, Paul Revere's house and much of his former houselot are owned and managed by the Paul Revere Memorial Association (PRMA). Recent archaeological investigations at the PRMA property resulted in the recovery of thousands of domestic, personal, and structural artifacts dating from the seventeenth through nineteenth centuries, and the identification of a range of features including privies, brick drainage channels, a cistern, cobblestone walkways, and remnant 17th and 18th century yard surfaces. This poster presents the functional and temporal relationships among the artifact and feature assemblages, and explores what those relationships tell us about household occupational sequences, changing social and economic dynamics in the North End, and the aesthetic or practical considerations that prompted landscape modifications to the houselot over time.

Gilman, Antonio (California State University-Northridge)

[211] *States in the Later Prehistory of the Iberian Peninsula?*

Over the past twenty-five years many prehistorians working in Spain have suffered from a severe bout of complexity inflation. The social inequalities apparent in the Copper and Bronze Age archaeological record in the Iberian Peninsula have come to be interpreted as reflecting the existence of state-type societies. Careful review of the evidence for political organization in Iberian later prehistory suggests, however, that the social formations of the Millaran and VNSP Copper Age and the Argaric Bronze Age were thoroughly intermediate in character and that their transegalitarian limitations were not overcome until the Iron Age.

[95] *Discussant*

Gilman, Patricia (University of Oklahoma)

[218] *Different but Stable Peripheries in the Mimbres Region of Southwestern New Mexico*

Peripheries are not all the same. Using three case studies of regions that were part of or related to the Mimbres cultural tradition but that were beyond the Mimbres Valley heartland in southwestern New Mexico, I show how each differed from the others. While it would be easy to attribute these differences to environmental variations, peoples' social identities were also dissimilar to that of the heartland, as pottery designs and site sizes and distributions suggest. Further, social identities were quite stable through time in these regions beyond the Mimbres Valley, hinting that relationships with the heartland and other areas remained constant.

Gilmour, Rebecca [42] see Lockau, Laura

Gilpin, Dennis [67] see Hays-Gilpin, Kelley

Gilpin, Dennis (PaleoWest Archaeology)

[123] *Chronologies and Scales in Reconstructing the Formation of Navajo Sacred Landscapes*

One of the initial task orders for the Navajo-Gallup Water Supply Project was to prepare an ethnographic overview of the project

area to provide a context for understanding traditional cultural properties that might be affected by the project. The overview identified several hundred previously documented Navajo traditional cultural properties, components of a sacred landscape created through the recounting of origin stories for ceremonies and clans and through the practice of Navajo ritual in daily life. Places in the sacred landscape achieved significance beginning in time immemorial, extending into the period described in documentary history, and continuing into the present. Examining the intersection of ancient stories and the practice of Navajo ritual in daily life in the context of various chronologies and scales illuminates the history and organization of Navajo sacred landscapes as exemplified in a case study of one portion of the project area.

Gilstrap, Will (University of Sheffield), Peter M. Day (University of Sheffield), Christina Marabea (University of Ioannina), Konstantina Kaza (Greek Archaeological Service, Attica) and Eleni Konsolaki (Greek Archaeological Service, Poros)

[288] *Bottoms Up: Ceramic Production and Consumption in the Late Mycenaean Saronic Gulf, Greece*

Mycenaean Palatial society has often been seen as characterized by a controlled and centralized economy, primarily on account of the Linear B inscribed clay tablets which recorded economic transactions of goods that occurred between the palace and its hinterland. However, recent research has started to indicate the extent of the economy that was beyond the grasp of the central bureaucracy.

Whitelaw has highlighted the substantial proportion of pottery production which was beyond that needed to supply the palace, an example which should warn against some of the recent attempts to read political boundaries from selected pottery distributions. This paper takes those insights further, eschewing a top-down approach, by examining a number of contemporary assemblages, belonging to the mature Mycenaean period, LHIIIB, in the Saronic Gulf. The identification of a totally imported assemblage at the harbor site of Kanakia on the island of Salamis is used as the starting point for a reassessment of pottery production and distribution in the area.

Exploiting a combination of chemical and petrographic analysis, applied to total assemblages from fine to coarse pottery, this innovative bottom-up approach provides a window on a complex world of ceramic consumption in an area characterized by dynamic early states.

Giordano, Celeste (University of Nevada Las Vegas) and Liam Frink (University of Nevada Las Vegas)

[130] *Women's Work in the Arctic: What Happens between "the Catch" and "the Meal"?*

Food storage and processing techniques in the Arctic have received little systematic attention as biocultural adaptations, despite the fact that the presence/absence of such techniques throughout human history has had an otherwise central role in anthropological research. The political ecology of Alaska partially explains the overemphasis on the collection of harvesting data; the interests of environmental conservationist and subsistence-permit regulatory groups are particularly prominent in Alaska politics and decisions depend on the documentation of procurement. This greater interest in quantifying harvests rather than seeking to understand the entire Arctic food system is further exacerbated by a long-standing, cross-disciplinary lack of interest in the people who are the primary decision-makers and who do the majority of work post-harvest – women. Here, we explore this knowledge gap between food procurement ("the catch") and consumption ("the meal") in rural southwestern Alaska by focusing on women's work. We present preliminary results from an ongoing ethnoecological project among the Yup'ik of Tununak, Alaska on the seal poke

storage system – a fading and undocumented traditional storage and processing technique that has persisted since at least late prehistory but which, within a generation, has been replaced by modern techniques with unknown and potentially harmful health consequences.

Giovas, Christina (University of Washington), Scott Fitzpatrick (University of Oregon) and Annie Caruso (University of Oregon)

[2] *An Analysis of Changing Mollusk Exploitation from the Chelechol ra Orrak rockshelter, Palau*
The analysis of an extensive assemblage of 95 discrete mollusk taxa (MNI > 15,000) from the site of Chelechol ra Orrak in Palau, Micronesia (ca. 2500 – 200 B.P.) provides important insight into prehistoric subsistence strategies over the course of more than two millennia. Results indicate that two taxa—Mactra clams and humped conch (*Strombus gibberulus*)—account for more than half of the species consumed through consecutive phases of occupation. Bivalves increase in importance through time driven by increased harvesting of Mactra, while gastropods decrease despite the overall importance of *Strombus*. These results, coupled with the analysis of fish remains, suggest that a decline in fishing was accompanied by an increase in shellfish consumption. We examine these trends in relation to changing settlement patterns and possible agricultural intensification.

Giron-Ábrego, Mario (California State University, Los Angeles)

[109] *The "Cave/Mountain Entering" Metaphor for Death and the Och Witz event on Stela 31*
Exploring the cave-related symbolism of “cave/mountain entering,” the Ch’orti’ metaphor for death, provides insights into the meaning of the och witz “mountain-entering” event inscribed on Tikal Stela 31. Interestingly, other hieroglyphic examples refer to stela and corpse deposition as “mountaining,” and thus och witz might be understood as entombment. In another section of Stela 31, the fourth century Tikal king, Chak Tok Ich’aat, is interpreted as having died in 378 C.E. when he “entered the water” och ha’. Och ha’, however, might have additional connotations related to initiation rituals and thus not simply death. The aforementioned och witz event takes place in 395 C.E., 17 years after och ha’, and is usually linked to the alleged Teotihuacano warlord Sihyaj K’ak’. There are structural reasons within the text, however, to suggest that och witz should be connected to Chak Tok Ich’aat instead. In light of the “cave/mountain entering” metaphor for death, we might be confronted with the possibility that Chak Tok Ich’aat did not meet his end in 378 C.E., but that he lived for another 17 years and was then entombed at the time of his death in 395 C.E.

Giusca, Claudiu [98] see Macdonald, Danielle

Gjesfjeld, Erik (University of Washington)

[258] *Hunter-Gatherer Pottery Production, Use, and Exchange in the Remote Kuril Islands*
The remote Kuril Islands of the North Pacific offer a unique setting to investigate the manufacture, use and exchange of pottery by maritime hunter-gatherers. Previous studies demonstrate continuous use of pottery from around 3700 to 500 years ago in spite of substantial environmental constraints to the production of pottery. These constraints include limited clay resources, year-round foggy and damp weather conditions and a limited supply of quality wood resources. Despite these challenging conditions, pottery remains are spatially and temporally ubiquitous throughout the island chain. This research investigates the use and exchange of pottery as forms of adaptation to the environmental conditions of the Kuril archipelago by two cultural groups, the Epi-Jomon and the Okhotsk. The use of pottery by these hunter-gatherers will be investigated through residue analysis with emphasis placed on differences in subsistence practices between Epi-Jomon and Okhotsk samples. The exchange of pottery will be investigated through geochemical analysis of pottery sherds from sites

throughout the island chain as well as Hokkaido. Furthermore, results from the geochemical analysis of pottery will also be used to infer social relationships between archaeological sites and the utilization of these social relationships as an adaptation to the variable Kuril environment.

Gladyshev, Sergei [222] see Gillam, Christopher

Glantz, Michelle, Tyler Beeton (Department of Anthropology, Colorado State University) and Katharine Horton (Department of Anthropology, Colorado State University)

[222] *Place and Space in Late Pleistocene Central Asia: Epistemological Constraints on Reconstructing Hominin Population Structure*

Because hominin population structure is inextricably linked to the landscape, biogeographic models can be used to test hypotheses concerning that structure and the conditions under which meta-populations interacted. The present study identifies combinations of abiotic variables that best predict hominin site preferences as a window onto differences in niche structure among the three Central Asian hominin groups identified by genetic research, Neandertals, Denisovans, and modern humans. We rely on ecological niche model theory and GIS methods to build a predictive surface from which hominin ranges can be defined. This model was first developed with Paleolithic sites from Uzbekistan, Tajikistan, and Kyrgyzstan and underscored the flexibility of hominin adaptations in this highly aridified zone of Central Asia. Our previous work has pointed to the peri-glacial mountain environments as being highly productive and able to support hominin habitation even in the coldest and most arid climatic phases of the late Pleistocene. The present study compares those abiotic variables that best predict hominin site location in arid Central Asia to those associated with the Paleolithic sites of the Altai. We specifically address epistemological issues concerning Paleolithic datasets as a way to critically evaluate assumptions about hominin population ‘dynamics’ in Central Asia.

Glascock, Michael [148] see Belardi, Juan

Glascock, Michael (University of Missouri), Michael Ohnersorgen (University of Missouri-St. Louis), J. Andrew Darling (Southwest Heritage Research) and Daniel E. Pierce (University of Missouri)

[279] *Progress on Sourcing Obsidian Artifacts from Western Mexico*

For decades, Mesoamerican scholars considered western Mexico to be a peripheral region of Mesoamerica. Other than awareness of the unique tomb chambers and associated ceramic offerings, the regional prehistory of western Mexico was largely overlooked. Although the tempo of archaeological research began to increase in the 1970s, interest in the abundant sources of obsidian located in mainly in the states of Jalisco, Zacatecas, and Nayarit continued to languish. In 1989, Dr. Phil Weigand and the Archaeometry Laboratory at MURR initiated a collaborative program to characterize the sources of obsidian, and it is now possible to conduct successful sourcing studies for most obsidian artifacts originating from sources throughout the region. This report will summarize the progress made in recent years on investigating obsidian sources and artifacts from western Mexico.

Glascock , Michael D. [288] see Cheetham, David

Glasier-Lawson, Maija (California State University, Chico)

[48] *Archaeological Explorers: Testing the Impact of Public Archaeology on Young Learners*
Archaeological Explorers was developed and implemented in 2010 as part of the California State University, Chico’s Outdoor Classroom. This educational module is designed to increase

cultural awareness and examine the far reaching effects of the 1849 California Gold Rush on both the people and the environment. Over the past two years more than 600 4th grade students have taken part in this "hands-on, minds-on" educational experience. Students are given pre- and post-assessments, the results of which are analyzed to determine the extent of change in knowledge, following participation in the module. Interviews of elementary school teachers, interns, and volunteers are analyzed using an inductive, qualitative approach to determine the impacts of the module. This paper presents the findings of both analyses and discusses the implications for future public archaeology endeavors focused on educating California's youth.

Gleason, Kelly (NOAA PMNM) and Jason Raupp (Flinders University)

- [73] *Lightning Strikes Twice: The Discovery and Identification of the Nantucket Whaleship Two Brothers at French Frigate Shoals in the Northwestern Hawaiian Islands*

Many are familiar with the fate of the Nantucket whaleship Essex, stove by a whale in the Pacific Ocean and cited as the inspiration for Herman Melville's Moby Dick. However, this dramatic experience was not the final chapter in Pollard's career as a whaling captain. After his return to Nantucket, he was given command of the whaleship Two Brothers. Unfortunately, the ship stuck a reef in the Northwestern Hawaiian Islands. Captain Pollard's career as a whaling captain was over, but the story of the Two Brothers still remains on the seafloor within Papahānaumokuākea Marine National Monument. The story of this shipwreck, and the mystery of her discovery, connects the small island of Nantucket with one of the largest marine protected areas in the world. In 2008, a team of NOAA maritime archaeologists made an exciting discovery at French Frigate Shoals: an early 19th century whaling shipwreck site. At that time, the identity of the site was unknown. It wasn't until 2010 when maritime archaeologists began to believe they were indeed looking at the remains of the Nantucket whaleship Two Brothers. The Two Brothers is an exciting find and an important maritime heritage site in the Northwestern Hawaiian Islands.

Gleba, Margarita [249] see Aldenderfer, Mark

Glencross, Bonnie

- [74] *Skeletal Trauma and a Phenomenological Approach to Developmental-Behavioral Age*
With methodological problems plaguing current biological aging techniques some bioarchaeologists have called for a change in how age is conceived and studied. Borrowing from psychology, human development is recognized as both biological and social. This lends well to the conceptualization of a developmental-behavioral aging approach in which changes to teeth and bones arising from human experience are considered age related markers of this process. Specifically, this paper considers skeletal trauma as phenomena related to both development and behavior with the ability to provide bioarchaeologists with a more nuanced understanding of aging, the life course and identity in the past. To illustrate this approach bone fractures found in the skeletal sample of Archaic hunter-gatherers from Indian Knoll, Kentucky are investigated and discussed.

Glenn, Ryan [102] see Tuma, Michael

Glover, Jeffrey [119] see Cook, David

Glowacki, Donna [23] see Reese, Kelsey

Glowacki, Donna (University of Notre Dame) and Fumiyasu Arakawa (New Mexico State University)

- [65] *Living and Leaving in Thirteenth-Century Mesa Verde*

By the turn of the fourteenth century, ancestral Pueblo people had departed from the Mesa Verde region, yet the circumstances that shaped their lives and led to their migrations and this large-scale depopulation varied from village-to-village and person-to-person. Although factors such as drought were broadly shared, they were experienced by people enmeshed in distinctive social networks and cultural configurations who were living in residences that differed in their environmental settings, their proximity to prominent landforms and resources, and their connections to powerful places. These "complex webs of association" changed through time producing historical landscapes that shaped the experiences and choices of the people, villages, and communities engrained in them. This paper examines how different historical landscapes affected how, when, and why ancestral Pueblo people decided to leave the region by comparing the histories of large, aggregated villages in eastern and western Mesa Verde, which had manifestly differing social, religious, and environmental settings. This intraregional comparison is augmented by the specific histories of Spruce Tree House and Sand Canyon Pueblo, which inform on how peoples' lives were affected by their rapidly changing social landscape during the decades prior to their emigration.

Goebel, Ted (Texas A&M University)

- [28] *Technological Change from the Terminal Pleistocene to Middle Holocene in the Eastern Great Basin, U.S.A.*

In the Great Basin of western North America, climate and environments warmed and dried significantly between 12,000 and 6000 radiocarbon years ago, leading to dramatic vegetation shifts, animal extinctions, and severe changes in human adaptation. Dry caves and rockshelters in the region offer a well-preserved and well-dated paleoecological and archaeological record, not just for reconstruction of human environments and subsistence, but also technology and settlement. In this paper, we focus on the record from the eastern Great Basin, centering discussion on Bonneville Estates Rockshelter and other caves located along the western margin of ancient Lake Bonneville. We review changes in raw-material procurement, technological activities within shelters, tool production, and bifacial-point manufacture and function—tracing these aspects of lithic technology against a backdrop of Younger Dryas cooling followed by significant post-glacial aridification. Our findings demonstrate that across the Pleistocene-Holocene transition, lithic landscapes utilized by humans became much more localized, occupation durations became much lengthier, and technological organization shifted to accommodate a more locally oriented, logistical settlement system. In addition, bifacial-point manufacture shifted from the production of multi-functional and easily recyclable stemmed points to side-notched points designed specifically for use as weapon tips.

Goepfert, Nicolas

- [228] *From Tombs to Ceremonial Deposits: Sacrifice and Animal Offerings in the Mochica and Chimú Cultures, Northern Coast of Peru*

Animals, and particularly camelids, have played an important role in the political, social and economic development of prehispanic cultures in the Central Andes. The study of faunal remains discovered in a hundred tombs and several ceremonial deposits from the Mochica (100-800 A.D.) and Chimú (850-1450) cultures allow us to understand the role they held in the funeral and sacrificial rituals of these complex societies from the Peruvian northern coast, and what their symbolism was. Wild and domestic animals were deposited in tombs but were also consumed in funeral feasts and sacrificed during major propitiatory offerings. A comparison of zooarchaeological data with the iconographic register shows that these animals have several ritual functions: they served as mortuary food and were also considered to be

mediators between the world of the living and that of the dead, but they also served as pets. The sacrificed animals (llamas, dogs) guide the souls of the dead in the afterlife, and this symbolism that can be found today through ethnographic testimonies.

Goh, Geok Yian (Nanyang Technological University)

- [154] *Potting a Timeline for Archaeological Sites in Myanmar*

This paper discusses the creation of a typology of earthenware pottery from three sites in Myanmar as a tool for illuminating the sequence of development of settlement patterns, economy, and identity formation from 500-1200s CE. Pottery has already been used to date archaeological sites in Myanmar. Chinese ceramics have been used to date sites in other parts of Southeast Asia, but no consistent effort to classify earthenware pottery types in Myanmar has yet materialized. A typology of earthenware is proposed based on: 1) vessel form and shape, 2) size, 3) color of bisque, 4) decoration (techniques and motifs), 5) thickness, 6) temper, 7) rim types, and 8) base types. The chronology of Burmese sites has been estimated on the basis of texts and radiocarbon dating; for Bagan, further evidence is provided by Chinese ceramics found in situ by the author. This paper aims to determine whether substantive differences in the earthenware pottery found in the sites can be detected based on published reports, and whether a preliminary chronology can be constructed from the data at hand. A hypothetical typology and chronology will be proposed for testing with a larger dataset.

Gokee, Cameron

- [121] *Bitter Pills to Swallow: Undocumented Migration and Medication in the Sonoran Desert*

Undocumented migrants traversing the US-Mexico border carry and consume diverse pharmaceutical products to deal with the pain, and potential dangers, inflicted upon them by the Sonoran Desert. Using data collected by the Undocumented Migration Project, this paper employs a spatial analysis of pharmaceutical consumption in order to better understand how migrants experience and respond to pain caused by both the physical landscape and wear on other technologies (i.e., water bottles, shoes). This analysis further reveals how variable access to pharmaceuticals plays into the structural violence meted out through US border policy and the political economy of clandestine border crossing.

- [121] *Chair*

Gokee, Cameron [121] see Gokee, Cameron

Goldhahn, Joakim (Linnaeus University)

- [163] *Bronze Age Rock Art and Seascape in the Eastern Baltic Sea, Northern Europe*

The Bronze Age in Southern Scandinavia is renowned for its enigmatic rock art. About 21 500 site are registered only within the borders of present-day Sweden. Most emphasis has been put on the Bohuslän area on the Swedish west coast, where the Tanum area is listed on UNESCO's World Heritage list. However, during the last couple of years Linnæus University have led a survey and documentation project in Tjust, situated on the Swedish east coast in the western part of the Baltic Sea. Before the project only 30 sites with figurative rock art were known in this area, none were documented in a scientific way, and national and international researchers very seldom treated the rock art from Tjust in their attempt to understand this visual culture. At the end of the project, autumn 2012, it has become the fourth-largest rock art area in northern Europe with more than 250 new sites with figurative rock art with more than 12 000 images. In this paper I present the outcome of the project and highlight this new corpus of rock art from a maritime perspective in relation to other rock art areas along the Swedish east coast in the western Baltic Sea.

Goldstein, Steven [80] see Capriles, Jose

Goldstein, Paul (UC San Diego)

- [238] *Under Many Ichu Roofs: A New Reconstruction of the Omo M10 Tiwanaku Temple*

Understanding monumental public architecture is critical to the debate over Tiwanaku sociopolitical organization. Did Tiwanaku sunken court temple complexes house a unitary authority charged with reproducing a central state cult? Or were the temples shared by a variety of constituent cults or corporate groups? Unfortunately, poor preservation of superstructure, internal divisions and access, and activity surfaces in the altiplano temples limits insight into the temples' tectonic impact and the function and affiliation of constituent space. Extensive 2011-2012 excavations of the desert-preserved Tiwanaku sunken court temple at Omo, Moquegua, Peru provide new data to inform both sides of this debate. As expected from prior research, a central processional axis of staircases and precisely aligned gateways led to and through the sunken court. The central axis terminated not in the sunken court, but in a chamber containing a massive U-shaped altar or throne overlooking the court. This supports the unitary practice and performance of a state cult. Surprisingly, the court was also flanked by six independent chapel houses, each secluded within a walled patio inaccessible from the central axis, suggesting autonomous pluralism. Ongoing analysis is considering the affiliation and function of these multiple and separate ritual and social spaces.

- [238] *Chair*

Golitko, Mark (Field Museum of Natural History) and Gary Feinman (Field Museum of Natural History)

- [106] *Network Analysis of Classic and Postclassic Obsidian Distribution in Mesoamerica*

Changes in the structure of Mesoamerican trade networks between the Classic (~A.D. 250-800) and Postclassic periods (~A.D. 800-1500) have been raised as a key factor in the rises, falls, and transitions in Mesoamerican political geography, for instance the collapse of major inland centers in the Maya area around A.D. 850, termed the Classic Maya "collapse." We evaluate these postulated shifts in the prehispanic economy using network analysis of obsidian distribution patterns on a Mesoamerica-wide scale, building on earlier work focused specifically on the Maya area of southeastern Mesoamerica. Methodologically, we address the utility of network analysis for analyzing prehistoric exchange systems and explore limitations of network reconstruction using archaeological materials.

- [161] *Discussant*

Golitko, Mark [167] see Terrell, John

Golubiewski-Davis, Kristina (University of Minnesota)

- [94] *What Now: Engaging with 3D Models beyond Specialized Software*

The Jeffers scanning project has produced models of several thousand petroglyphs from Jeffers. While an important goal of the project is to foster new analytical techniques, we are also committed to making the results of the project available to non-specialists without access to specialized and expensive software. For more than a decade the Anthropology Labs at the University of Minnesota have been developing delivery techniques for students and other groups. Emerging web protocols, including HTML5 and ThreeJS, provide an opportunity to create web-based systems that can create a rich experience without demanding any specialized equipment or knowledge for access. This paper presents results from a project creating a web-based delivery system for 3D models of petroglyphs from Jeffers. Important questions include: What is engaging to non-specialists?

How can the models be shown in a dynamic, yet user-friendly, way? What technological constraints shape what can be presented? Addressing these questions is crucial to the successful utilization of these 3D resources.

Goman, Michelle [264] see Hedgepeth, Jessica

Gomani-Chindebvu, Elizabeth [76] see Nightingale, Sheila

Gomez, Esteban (The Colorado College) and Elisa León (University of Costa Rica)

[264] *An Archaeological Investigation of Identity and Social Transformation in the Guanacaste Region of Northwestern Costa Rica*

The following paper will cover the archaeological research undertaken at Finca Chiva, located in the Guanacaste region of northwestern Costa Rica. The following project is concerned with identity and social transformation, particularly how the community was socially produced during the Bagaces and Sapoá time periods.

Gomez Choque, Emmanuel [272] see Kurin, Danielle

Gomez-Gastelum, Luis (Universidad de Guadalajara)

[107] *Notas para el estudio de la niñez en el antiguo occidente de México*

En este trabajo se realiza una revisión de la información arqueológica del occidente de México, relativa a la niñez, y se le analiza en el marco de las propuestas teóricas que se han desarrollado en los últimos tiempos. En primer lugar se ofrece un panorama de las herramientas teóricas utilizadas en el estudio arqueológico de la niñez. Un segundo tiempo efectúa la recopilación y sistematización de la información sobre los niños en el marco temporal de la época prehispánica. Por último, se contrastan los contenidos de ambos apartados y se discuten las posibilidades de los estudios sobre la niñez en la arqueología del occidente de México.

[107] *Discussant*

[107] *Chair*

Gongora, Angel (Centro INAH Yucatán), Cristian Hernandez (Centro INAH Yucatán) and Ruben Chuc (Centro INAH Yucatán)

[36] *La actividad pesquera entre los mayas prehispánicos del noroeste de Yucatán*

La actividad pesquera fue una actividad de gran importancia para el desarrollo de la sociedad maya prehispánica. Esta práctica proporcionó no solamente recursos alimenticios a la población sino también materia prima necesaria para la elaboración de artefactos utilitarios y rituales. Esta presentación analiza la información arqueológica registrada en sitios costeros y del interior del norte de Yucatán que aparentemente cuentan con evidencia de actividad pesquera; los hallazgos se refieren en general a pesas de red, anzuelos y probables arpones, así como a los restos de diversas especies marinas. Estos elementos son identificados en términos de la relevancia de las características que presentan como un medio para identificar sitios de actividad pesquera en el norte de Yucatán. Nuestro objetivo es el proponer un modelo de aprovechamiento y explotación de los recursos marino-litorales que pueda servir como base interpretativa para futuros trabajos arqueológicos realizados en esta región peninsular.

Goñi, Rafael [148] see Belardi, Juan

Gonlin, Nan (Bellevue College) and Kristin Landau (Northwestern University)

[144] *Maya on the Move: Population Mobility during the Classic Period in the Copán Valley, Honduras*

The population dynamics of the Classic Maya collapse can be studied from a macro-demographic perspective that entails broad settlement surveys in rural and urban areas, as well as micro-demographic processes that are detected from individual loci of habitation in various zones of settlement. At Copán, Honduras, a Classic Maya (AD 250-900) center on the southeastern periphery of the Maya region of Mesoamerica, archaeological investigations over several decades have produced abundant databases that span early occupation to abandonment in multiple areas of the valley, making Copán an ideal site for addressing questions of population mobility on both the macro and micro levels. Recent investigations by Kristin Landau complement previous work by Nancy Gonlin. These data provide an evaluation of urbanizing and de-urbanizing processes that led to population mobility among the Classic Maya in the Copán Valley.

[210] *Discussant*

Gonzales, David [86] see Arakawa, Fumiyasu

Gonzalez, Toni (California State University, Los Angeles) and Dr. Helen Haines (Trent University)

[109] *Exploring the Ritual Function of Chultuns: A Taste From Ka'Kabish*

The function of chultuns has been a topic of debate from early in the 20th century. While chultuns in the northern Maya lowlands are well accepted as water cisterns, the function of chultuns in the southern Maya lowlands is still hotly debated. Although experiments by Dennis Puleston have shown that almost nothing can be stored in chultuns, storage remains the most widely accepted function.

Excavations conducted at the ancient Maya site of Ka'Kabish in north-central Belize explore the possibility that chultuns served a religious function as earth shrines. My hypothesis has been informed by recent discussions of Maya cosmology stressing the importance of a sacred Earth. The discovery of man-made caves, often with forms similar to chultuns, illustrates the need for such spaces. Finally, ethnographic and ethnohistoric evidence shows that excavations in the earth, even for utilitarian purposes, always have sacred connotations.

Gonzalez, Sara (Carleton College)

[127] *Families, Households, and Community: A Fort Ross Narrative*

The defining feature of social life at Colony Ross was undoubtedly the inter-ethnic relationships formed and negotiated amongst the Russian American Company's multi-ethnic workforce and local Native Californian women. Yet, when you visit the park today little serves to remind us of the bustling ethnic neighborhoods surrounding the reconstructed stockade where the majority of the settlement's residents conducted their daily lives. We also see few traces of the interethnic households established by Alutiiq, Unangan, Tlingit, Tanaina, Yakut, Russian, and Creole men, and women, who for the most part came from Kashaya Pomo, Coast Miwok, and Southern Pomo communities. But we know from both archival and archaeological research that colony Ross was not simply a Russian outpost—it was in fact primarily an indigenous space; a place where individuals from these communities made new homes, new connections, and new lives. Recent research at the North Wall Community provides glimpses into the households and daily lives of Colony Ross's Native Californian women and their families. This paper explores how a community-based approach to the archaeology of colonialism is changing our understanding of the ways in which North Wall residents negotiated self and community at Fort Ross.

Gonzalez, Sara [169] see Nelson, Peter

González, Raymundo Javier [33] see Rivas, Javier

González La Rosa, Luis Manuel [214] see Whalen, Verity

Gonzalez Lauck, Rebecca

[4] *Discussant*

González Morales, Manuel [220] see Fontes, Lisa

Gonzalez-Licon, Ernesto (INAH-ENAH, Mexico)

[252] *Mixtec Hieroglyphic Turquoise Tablets in La Cañada Region: Function and Meaning*
The archaeological recovery of wood tablets with inlays of Turquoise forming a hieroglyphic image is not common in the region due to the distance and the perishable nature of wood. In this case, the discovery took place in a funerary context of a cave in the region of La Cañada, Oaxaca. Considering the characteristics of the associated materials such as jade beads, ceremonial pottery and the hieroglyphic turquoise tablets, it can be inferred that this cave was selected as the final depository of high-level social and political Mixtec individuals.

[46] *Chair*

Gonzalez-Tennant, Edward (Monmouth University)

[99] *New Heritage and Dark Tourism: A Mixed Methods Approach to Social Justice in Rosewood, Florida*
Scholars of difficult heritage continue to seek new methods producing meaningful engagements with diverse audiences while simultaneously supporting the goals of social justice. This paper specifically examines the potential new heritage has for social justice at dark tourism sites. New heritage is the intersection of new media technologies and cultural heritage, whereas dark tourism refers to the visitation of sites where tragedy or death is a primary aspect of a place's history. The author outlines a mixed methods approach combining virtual world environments and digital storytelling to support social justice. The paper's case study focuses on Rosewood, Florida; a once prosperous African American community destroyed during a week-long episode of violence in 1923. This event ended with the systematic burning of every black-owned building and the complete expulsion of the area's African American population. Dark tourism sites often provoke an emotional response from visitors. A deep emotional engagement with a place's history is often a requirement for engaging visitors. This paper closes with a discussion of how new heritage can avoid depoliticizing complex histories of disenfranchisement while eliciting poignant and critical reflection from visitors.

Goodale, Nathan [120] see Hill, Katherine

Goodale, Nathan (Hamilton College), David Bailey (Hamilton College), Alissa Nauman (Hamilton College) and Ted Fondak (Hamilton College)

[125] *There's an App for that: Mobile Devices in Archaeological Field Research*
Mobile devices can be transformative in the way archaeologists do field research. Instrument capabilities include rich connectivity (WiFi, Blue Tooth, cellular, GPS), long battery life, different interaction modality, high resolution IPS screens, front-facing camera (allowing in-field AV conferencing), 5 mega pixel back-facing camera, digital compass, accelerometer, and gyroscope. In

addition, applications can be written by comparatively simple code so researchers could easily use these features to accommodate their own specific needs. The instruments and applications are cost effective as well as portable and durable (with a good case). During the summer of 2012 we incorporated iPad instruments and GIS applications in a geochemical rock sourcing project in the Upper Columbia River Drainage of the Interior Pacific Northwest. In this paper we detail the functionality of these instruments in a difficult environment for connectivity to collect and share archaeological data during survey and future possibilities for recording excavation.

[125] *Chair*

Goodman-Elgar, Melissa (Washington State University), Nichole Bettencourt (Washington State University) and Richard Conrey (Washington State University)

[62] *Prospects for Field Determination of Elemental Composition by pXRF on Anthropogenic Sediments*

Following our successful preliminary experiments comparing a Bruker tracer IV pXRF instrument performance to laboratory WD-XRF on powdered archaeological sediments, we conducted new experiments on intact sediment blocks and hand-ground sediments. These sample introduction methods are more suited to field conditions than our prior experiments. We determined the analytical conditions required to reproduce the high correspondence we found previously between WD-XRF and pXRF on these coarser subsamples of the same sediments. Thresholds of replicability were determined by performing multiple replicate readings on each sample and evaluating these runs against laboratory determinations. There is a distinct trade-off between accuracy and the number of replicate readings performed. We present the implications of these experiments for the reliable recovery of compositional data from anthropogenic sediments in the field using pXRF. Our sediments are from the Bolivian Andes and similar experiments from other case studies are necessary to determine if the conditions presented here will apply to other depositional settings.

[224] *Chair*

Goodman-Elgar, Melissa [224] see Nanavati, William

Goodwin, Conrad

[73] *A Conversation about the Trajectory of Historical Archaeology In Hawaii Conrad "Mac" Goodwin*

Archaeological work in Hawaii in the historical period is often overshadowed by interest in prehistoric periods. As in many places in the United States, there have been multitudinous projects undertaken through the auspices of cultural resource management, but too few of these projects find their way into mainstream scholarship. In this paper, Conrad "Mac" Goodwin will reflect on his long career in historical archaeology in Hawaii in a question/answer format.

Gordaoff, Roberta [117] see Parsons, Ted

Gordaoff, Roberta (University of Alaska Anchorage)

[127] *Intrasite Spatial Analysis of an Upland House on Adak Island, the Aleutian Islands, Alaska*

Provenience data of lithic artifacts from a 3400-year-old upland house (ADK-237) on Adak Island, the Aleutian Islands, Alaska, are used to identify activity areas. Acidic soil on Adak Island creates poor preservation conditions so only lithic materials are recovered. The house was cleaned at departure and formal tools removed from the house. Household artifacts, primarily debitage, are in the roof-fall providing information about outdoor work areas. More debitage appears on the east side of the house opposite the

summer prevailing westerly winds. Lithic tools at ADK-237 are primarily flake tools with some formal tools still present though most artifacts are debitage. Tool materials include andesite, basalt, and chert mainly basalt though also andesite and chert Obsidian was present but rare. Bifacial and Unifacial technology are equally present.

Gore, Angela [28] see Graf, Kelly

Goreczny, Angela [68] see Walker, Morgan

Goring-Morris, A. Nigel [162] see Birkenfeld, Michal

Goring-Morris, Nigel (Hebrew University) and Leore Grosman (Hebrew University)

[190] *Tradition, Tradition, Tradition: Long-Term Continuity and Change in Funerary Practices from the Galilee, Israel*

Continuity in various traditions has long been recognized in the Levant during the Epipaleolithic Natufian through to and including the Pre-Pottery Neolithic B (PPNB). These traditions span the shift from semi-sedentary foraging bands to settled farming village communities.

We present evidence from two small and unusual cemetery sites, located 20 km apart within hilly regions of the Galilee, Israel. While the cave occupation of Hilazon Tachtit is attributed to the Late Natufian (10,750-10,500 cal B.C.), Kfar HaHoresh is an open-air PPNB site (8,500-7,000 cal B.C.).

The location, scale and architectural features of the sites differ and contrast with those of local coeval settlements. Furthermore, the nature of the burials, with extensive manipulation of the human remains, and associated material culture remains, including faunal remains and their contexts display considerable similarities between the two sites.

We examine the dynamic nature of continuity and change in human agency during this interval of major and significant economic and social transformations involving the domestication not only of plants and animals but also social and symbolic relations. Finally, we attempt to address the question as to the role of tradition throughout the Levant during this formative period.

[190] *Chair*

Goriunova, Olga [194] see Schulting, Rick

Gorman, Alice (Australian Cultural Heritage Management)

[13] *Robot Avatars: The Material Culture of Human Activity in Earth Orbit*

Since the launch of Sputnik 1 in 1957, more than 7000 rocket launches have delivered payloads into space that now are a critical part of the infrastructure of modern life, particularly in telecommunications and navigation. This paper discusses the broad research questions that can be addressed by investigation of the thousands of satellites, rocket bodies, and pieces of junk currently in Earth orbit. Their materials and design reflect the nature of our social and political interactions with space and adaptations to a new environment, a robotic colonial frontier. Factors that contribute to the character of this material record include microgravity, extreme temperature and radiation conditions, national political and scientific agendas, and technological styles through time and across terrestrial cultures. In other words, what can space junk tell us about contemporary life on Earth? However, unlike terrestrial artifacts, satellites in orbit are barely visible to us and are not designed to interact with human bodies in any way. They may represent the beginnings of a technological trajectory that will transform how human cultures relate to time and space.

Gosden, Chris

[292] *Time and Identity in the Pacific*

In this paper I will put forward the idea that identity is inherently temporal - who we are depends upon the manner in which we connect up past, present and future. Notions of time are culturally variable and hence too the conceptions of past, present and future, as well as the relationships between them. Notions of cultural heritage employ rather simplistic notions of how the past influences the present. In this paper, I shall attempt to complicate ideas of cultural heritage and develop one brief case study as to how this might work out in practice.

Goshen, Shannon (California State University, Sacramento)

[263] *Late Holocene Trends in Prehistoric Waterfowl Exploitation: Evidence from the Lower Sacramento Valley, California*

Recent studies of faunal assemblages from archaeological sites in Sacramento Valley, California have illustrated the substantial impact prehistoric humans had on mammal and fish resources. Resource intensification analyses document a decrease in foraging efficiency and suggest populations of profitable mammal and fish were increasingly depressed through the late Holocene. Yet, limited research on the impacts of harvest pressures on prehistoric bird resources exists for the region. Modeling a similar study of avifauna exploitation in the San Francisco Bay, I test the hypothesis that profitable avian taxa were depressed by prehistoric hunters in the lower Sacramento Valley. In this paper, I discuss the results of a comprehensive examination of avifauna assemblages, particularly anatid remains, from several sites in the lower Sacramento Valley. Results align well with patterns evident in other archaeofaunal assemblages in the immediate region and beyond, and are suggestive of resource depression.

Gosman, James, David Raichlen (Department of Anthropology, University of Arizona) and Timothy Ryan (Department of Anthropology, Pennsylvania State University)

[74] *Human Transitions: Current Perspectives on Structural Change in Bone During Development*

The initiation and maturation of human walking combined with increasing body mass during ontogeny contribute to major alterations in the mechanical loading of the lower limb skeleton throughout childhood and adolescence. The goal of this study is to examine the developmental trajectories of long bone structure from birth to adulthood. High-resolution X-ray CT scans were collected for the femur and tibia of 70 individuals from the Norris Farms #36 skeletal collection ranging in age from neonate to adult. The entire bone was scanned with voxel dimensions less than 0.05 mm. Regional, slice, sector, and surface-specific cortical bone cross-sectional geometric properties were quantified. Quantitative 3D trabecular bone fabric structure was analyzed for multiple cubic volumes of interest. These morphometric data were linked to new age-grouped kinematic/kinetic gait analyses. The results indicate that cortical structural differentiation follows broadly similar growth trajectories in the femur and tibia. Trabecular bone structure analysis displays a more complex pattern with most variables following anatomically-specific trajectories reflective of localized bone growth, (re)modeling processes, and joint kinematics of early and maturing walking. These results indicate defined transition patterns during ontogeny. Biocultural implications of these research findings are linked to variations in life history, including childhood health and well-being.

Gough, Stan [224] see Truman, Elizabeth

Gould, Richard (Brown University)

[135] *Looking Back: Ten Years after the "Station" Nightclub Fire, West Warwick, RI*

This 2003 disaster was an early test for forensic archaeology. The fire led to 3 criminal indictments and 46 civil suits -- the largest number in the history of the state arising from a single case. The criminal sentences are completed, and the last civil suits were settled in late 2012. So this is the first time it is possible to discuss specific archaeological evidence openly and to consider some of the lessons learned. The biggest lesson was that archaeology is most effective in the initial court proceedings, when depositions are taken and the lawyers on both sides see the physical evidence in detail. If performed up to current medical/legal standards, archaeological findings will not be challenged later in open court. Examples of this evidence and how it was treated will be presented.

[230] *Discussant*

Gourd, Andrew [169] see Martin, Lucius

Grabowska, Samantha (University of Michigan - Architecture)

[121] *Clandestine Architecture along the U.S.-Mexico Border: Housing the Invisible Body in a Landscape of Surveillance*

For over a decade, Arizona has been the busiest crossing point along the southern border for both undocumented migrants and marijuana drug mules who attempt to enter the United States without authorization by walking for several days across the Sonoran Desert. Subsequently the southern Arizona desert is now a landscape peppered with small, temporary structures built by these travelers. Not only do the structures shelter the body from the harsh environment, but they also work to mediate and define the role of the invisible body in a landscape of surveillance. Migrants and smugglers, Border Patrol, Arizonans, and now, researchers all cohabit the desert. These populations are in a constant state of tension, revealing and concealing themselves and one another. By examining the material culture left behind by the migrants and smugglers (such as clothing and food wrappers), the structural qualities of the shelters (and their relationship to the landscape and survival needs), and the intricate power interplay between populations who share and contest the landscape, one can develop a richer theory of place. Place becomes something other than a single stationary object with a single shared meaning. Instead it is an interrelated process involving multiple populations, perceptions, and activities.

Gracer, Allison (University of California, Santa Barbara), Amber VanDerwarker (University of California, Santa Barbara) and Gregory Wilson (University of California, Santa Barbara)

[6] *Maize Intensification in the Mississippian Central Illinois Valley: Metric Data from Maize Kernels and Cupules as a Means to Establish the Number and Type(s) of Varieties*

Recent archaeobotanical data from sites spanning the Mississippian period in the CIRV reveal that maize production increased throughout this period. This research seeks to determine if production increases involved the introduction of new varieties of maize as a component of agricultural intensification. We present metric data on kernels and cupules from five sites dating A. D. 1100-1300. Preliminary data suggest that initial production increases (seen during the Eveland and Orendorf phases) were not accompanied by the adoption of additional varieties. It was not until the subsequent Larson phase that a new type of maize was introduced into the cropping cycle.

Graesch, Anthony (Connecticut College) and Tianna DiMare (Connecticut College)

[69] *Fire-Affected Rock: Advances in Household and Experimental Archaeological Approaches to the Study of Indirect Cooking and Foodways*

Fire-affected rock (FAR) - rock that has been cracked, discolored, or otherwise physically altered as a result of exposure to hearths, cooking features, and other sources of fire - is among the most ubiquitous and abundant artifacts observed in many

archaeological sites. It is also among the least studied elements of the archaeological record. Methods for the documentation of FAR are rarely systematic and have not been afforded the same disciplinary scrutiny as that applied for the study of lithic, zooarchaeological, and paleoethnobotanical assemblages. This is surprising, if only for the fact that FAR is often a product of cooking via indirect heat sources and thus pertinent to regional- and household-level studies of foodways. This poster highlights recent experimental and archaeological research aimed at understanding the conditions by which FAR is created and how variable distributions of FAR in archaeological sites might be interpreted. We present data from over 30 days of carefully planned experimentation that entailed heating river cobbles for the purpose of cooking. We then explore how these data may help explain household-level variability in the distribution of over two metric tons of FAR documented at Welqámex, a Stó:lō-Coast Salish settlement in southwestern British Columbia.

Graesch, Anthony [205] see Blagg, Jennifer

Graf, Kelly (Texas A&M University, Department of Anthropology) and Angela Gore (Texas A&M University, Department of Anthropology)

[28] *Technological Organization at Owl Ridge and Dry Creek: Human Response to Late Pleistocene Environmental Change in Central Alaska*

When faced with major climate change, hunter-gatherers make the choice to maintain status quo or alter organization of their technologies in an effort to adapt to transforming landscapes. In many northern regions the transition from late Pleistocene to early Holocene was interrupted by the Younger Dryas cold event, a brief period of rapid climatic reversal. In this paper, we use lithic records from the Owl Ridge and Dry Creek sites located in the Nenana River valley in central Alaska to investigate change in technological organization from 13-11ka. Our results show that just prior to the Younger Dryas hunter-gatherers were procuring lithic resources mostly from local sources, and their core (primary) reduction and tool production and maintenance (secondary reduction) technologies were expedient. Both sites experienced a brief hiatus in occupation during the height of the Younger Dryas event. Just following the Younger Dryas technological organization changed. Lithic assemblages signal procurement of both local and exotic lithic resources and production and maintenance of more formal, standardized primary and secondary reduction technologies. We conclude that in the Nenana valley, lithic technologies were reorganized in response to a shift in ecological parameters during the Younger Dryas.

Graff, Rebecca (University of Chicago)

[209] *Archaeological Field Schools as Global or as Local? A View from Chicago*

For many undergraduate students, the easiest and often most affordable way to gain archaeological field experience involves participating in local projects, ones that are often spatially proximate to their home institutions. This paper draws from several historical archaeological field schools held in Chicago to ask the following questions: Can "global" experiences likewise be found in American urban sites? What do students gain, beyond methodological perspectives, from a close engagement with local history, and how does this compare to experience abroad? How do archaeologists as instructors balance student learning outcomes with research goals when a local dig experience beckons certain students who lack long-term archaeological ambitions? And finally, is an "authentic" field school experience predicated upon the shared sociality that comes with living together in a foreign locale?

Graham, Shaw

[106] *Reanimating Networks with Agent Modeling*

In this paper, I present thoughts on how to reanimate networks extracted from Roman materials, using agent based models. In particular, I look at networks extracted from the epigraphy of the Roman construction trade in the Tiber Valley. I then use these as the substrate for the pattern of interactions in an agent based model to explore the likely consequences for information flow in such a(n artificial) society. Conversely, I explore then how agent models can be used to simulate past patterns of interaction, generating networks which we could then use to map against archaeological materials. Many different processes could create the patterns we see archaeologically; agent based models used in this generative capacity allow us to narrow the field.

[23] *Discussant*

Grandia, Fidel [147] see Weller, Olivier

Grave, Peter [65] see Kealhofer, Lisa

Gravel-Miguel, Claudine (Arizona State University)

[68] *Teeth Travel: Raw Material Choice and the Movement of Cervid Artifacts in the Upper Paleolithic*

Ornaments and portable art objects have mostly been studied through their material and iconography, while the choice of their raw material and movements over time have been neglected. When considering Upper Paleolithic ornamentation, preferences for specific materials are perceptible, but seldom studied or explained. The present research aims to palliate this gap by mapping the spatial and temporal distribution of ornaments and portable art objects made on deer and reindeer osseous material. In particular, I am using data collected on ornaments and decorated artifacts found in French and Spanish sites dated to between 20 and 14,000 calibrated years BP. Through GIS mapping of those artifacts in contrast to the spatial and chronological distribution of deer and reindeer fauna, I reveal that ornaments – specifically deer teeth – have a tendency to travel longer distances than other types of artifacts made from the same raw material. Through this spatial and tight chronological study, I can thus relate differential choices of material and movement to the climatic and demographic contexts of the Last Glacial Maximum upturn.

Graves, Michael [5] see Morehouse, Jana

Graves, Michael (University of New Mexico)

[64] *The Role of Advanced Field Training in Archaeology: Innovation, Application, and Research Outcomes*

The archaeological field school at Grasshopper was in some ways unique. It is notable for the opportunity provided graduate students to develop innovative research programs undertaken with a large degree of independence. My analytical research as a graduate student focused on tree-ring dating and I was involved in early syntheses of the prehistory of the Grasshopper and Canyon Creek Ruins and the larger region. Tree-ring dating and ceramic seriations stimulated my interest in chronologies, chronometric methods, and the implications to be drawn from these for understanding late prehistoric dynamics in east-central Arizona. The kinds of ethnoarchaeological analyses I completed using Kalinga data were informed by the dimensions of change and societal scale that were learned at Grasshopper. The synthetic research on population growth, environmental change, and organizational responses that I authored on Grasshopper established a research trajectory that remains today in the work I do on the dynamics of prehistoric Hawaiian agriculture, social units, territoriality, and social complexity.

Graves, Adam

[116] *Meet at the Meat!?*

The results of elemental analysis using laser ablation indicate that Folsom-age bison were moving long-distances, albeit not all of them. The evidence presented in this study suggests a latitudinal movement of bison on and off the southern High Plains according to seasonal changes during the Folsom Period. I posit that the manner in which humans located bison on the Southern Plains and organized their movement strategies (aggregation and dispersal) to hunt bison took advantage of the locations of bison across the landscape during different times of the year. Further, Folsom hunters structured their settlement in a way whereby residential mobility was low throughout much of the year, but high during the fall when moving to the periphery of their territory on the Southern Plains was advantageous for meeting other groups and procuring large numbers of bison.

Gray, Jamie [86] see Schleher, Kari

Greaves, Russell (Peabody Museum, Harvard)

[217] *Ethnoarchaeological Observations of Resource Tradeoffs: Using Pumé Savanna Hunter-Gatherer Subsistence Choices to Model Archaeological Diets*

Analyses of several ways of calculating return rates from ethnoarchaeological data on Pumé foragers of Venezuela are used to examine seasonal subsistence tradeoffs. These data provide opportunities to model reliance on wild foods, incorporation of introduced resources, and minimal complementary horticulture. Hyperseasonal variation in rainfall dramatically alters hunting, fishing, and plant food collection options among these savanna hunter-gatherers. Unlike many foragers, the Pumé rely on small body size animals (~0.1-1kg) for most of their hunted game and mean returns are between 2.2 kg and 4.0 kg per hunter per trip. Fishing also captured small fish (0.1-0.19 kg, depending on fishing method) with mean returns of 2.2 kg per fisherman per trip. Women's collection of wild roots produced means between 5.3 and 11.8 kg to per woman per trip, depending on season and root target. Fruit collection produces mean returns of 2.2 kg (indigenous fruits) and 29.2 kg (from feral mango trees) per woman per trip. Frequency differences in subsistence trips also affect the contributions of hunting, fishing, and wild plant food gathering to the total diet. Ethnoarchaeological data provide crucial ways to develop archaeological models of subsistence, labor, mobility, and technological behavior of past hunter-gatherer populations.

Green, Richard E. [20] see Thalmann, Olaf

Green, Ulrike (University of California San Diego) and Kirk E. Costion (Oglala Lakota College)

[24] *Modeling Ranges of Cross-Cultural Interaction in Ancient Borderlands*

The current state of archaeological investigation of ancient peripheries recognizes them as extremely complex settings that encompass multiple layers of material expression of intricate social, ethnic and ideological identities and relations of individual agents and entire social groups. Especially in contexts of colonial exchanges trying to model such a broad range of multifaceted exchanges and changes is quite a challenge and multiple theories and representations have been proposed over the years. In this paper we analyze the shifting social and ethnic boundaries between colonial Wari and local Huaracane material traditions in the Moquegua Valley of Southern Peru. Using our research from the early Middle Horizon period (A.D. 500-800) we propose an interaction model for the middle-valley area that highlights the fluidity of boundaries of social identities within groups of power seekers, while enforcing rigid norms for other social groups in this

particular frontier. We propose a model of cultural interaction that considers the interaction between indigenous communities and colonizers as a range of simultaneous relationships that make a variety of interactions between groups of local populations and new arriving foreigners possible. We hope that this model, while illustrating a particular example, may also be applied in other frontier exchanges.

Green, Kirsten

- [41] *For the Love of Corn: Changes in Osteoarthritis of the Elbow and Shoulder Joints in Women When Transitioning from Hunting and Gathering to Agricultural Subsistence*

Changes in bone morphology have always been a concern to physical anthropologists that are trying to explain a culture's everyday activity. These types of changes, including arthritic and musculoskeletal, are based on the observation of the researcher and are, therefore, conducive to observer error. Using two Native American samples, the Illinois and Kentucky, and a control sample from the Terry collection, I was able to employ a scoring method based on Hawkey (1988) for arthritic changes in women when transitioning from a hunting and gathering to agricultural subsistence. This scoring method gives credibility to the observations and it gives the researcher quantifiable data to use for statistical analysis. Understanding the change in women before and after the transition period allows archaeologists to construct a better picture of the daily activity and labor divisions for the population.

Green, Shannon (University of California - Davis), Sarah Brown (University of California - Davis), Christyann Darwent (University of California - Davis), Jelmer Eerkens (University of California - Davis) and Ben Sacks (University of California - Davis)

- [71] *A Dog's Tale: Understanding the Role of Dogs in the Kotzebue Sound Region of Alaska through Ancient DNA and Stable Isotopes*

Dogs were essential to hunting and sledding in Inupiaq territory, and because of the work of J. L. Giddings, who undertook numerous excavations in the Kotzebue Sound region of Alaska from the late 1940s to early 1960s, we have a record of dog use both through time and across space. These faunal collections include Cape Krusenstern and Choris Peninsula on the coast, and Onion Portage (Haffenreffer Museum of Anthropology) and Ahtut (Museum of the North) in the interior and span from ca. 2800 B.C. to A.D. 1700. Recent excavations at coastal sites such as Kotzebue, Deering (Northern Land Use Research) and Cape Espenberg (INSTAAR-Boulder) also yielded dog samples. Over 90 samples were tested for ancient DNA, and a subsample tested for C & N isotopic analysis to assess differences in dog provisioning. Results indicate that haplotype A31 is most commonly represented this dog population, which continues to dominate the modern Inuit Sled Dog. However, other haplotypes (e.g., A29, A121) are of Asian origin. Hence dogs provide another means of understanding the culture history of the Arctic.

Green, Debra (IARII) and Kimball Banks (Metcalf Archaeological Consultants, Inc.)

- [125] *Over the Mound and into the Pit: Mitigation at the Larson Site (32BL9), North Dakota*

In the fall of 2010, archaeologists from Metcalf Archaeological Consultants, Inc. excavated part of the Larson Site (32BL9), an ancestral Mandan earthlodge village near Bismarck, North Dakota. The site was occupied from the late 1400s to the late 1700s. The excavation was undertaken to mitigate impacts from widening a county road bisecting the village. By the end of the project, archaeologists had excavated 54 features and had traced the geoarchaeological history of the site. The results of the fieldwork are discussed along with the challenge of interpreting the archaeology and geoarchaeology of a previously disturbed, complex site.

Green, Adam (New York University)

- [245] *Discussant*

Greene, Richard and Steve Baumann (El Malpais National Monument)

- [85] *The Unique Archaeological Landscape of the El Malpais National Monument Lava Flows*

El Malpais National Monument, located at the edge of the Colorado Plateau near the southern boundary of the San Juan Basin, was established due to the sizable lava flows covering this area. The interaction of pre-contact Puebloan peoples with this unique landscape has produced equally distinctive archaeological features. While the typical Four Corners region sites are present such as small pueblos, field houses, rock art, agricultural features, and water impoundment features, also found are atypical features within the lava flows. Recent surveys into this area has revealed cairn trails containing bridges, shrines, caches and other features including elaborate game traps, basalt architectural complexes with unusual features, and the use of permanent ice caves. Studying the context of these features within the landscape and their unique architectural aspects provides an opportunity to examine past human adaptation to atypical land forms such as lava flows. In fact, archaeological exploration within the flows is finding a network of trails and features that imply a sophisticated use of the landform going back hundreds of years. These preliminary archaeological investigations suggest that the trails, trail features, and other site types may have served both economic and ritual functions.

Greenlee, Diana [34] see Hargrave, Michael

Greer, Sean (University of Minnesota), Kieran McNulty (University of Minnesota) and Laura Vietti (University of Minnesota)

- [94] *Assessing Petroglyph Variability Via Roughness and Fractal Analysis*

One impediment to understanding the stories and beliefs recorded in the petroglyphs at Jeffers is that traditional methods of recording the carvings do not capture detailed information on surface morphology. The three-dimensional models acquired during the Jeffers scanning project do gather such information. The goal of this paper is to begin incorporating those data into understanding of petroglyphs. Surface metrology and fractal analysis are well-established techniques for characterizing three-dimensional surfaces. In this paper, we use these methods to explore two different questions. First, what is the relationship between surface morphology within petroglyphs and general shape categories? For example, do all bison have the same internal morphology, and is that morphology shared with other types of petroglyphs? Second, do petroglyphs incorporate geological features such as cracks and glacial scrape marks? Answers to these questions will provide new means of investigating production techniques and stylistic associations among petroglyphs.

Gregg, Michael (University of Pennsylvania Museum) and Greg Slater (School of Geography and Earth Sciences, McMaster University)

- [253] *Improving the Diagnostic Capabilities of GC-C-IRMS Analyses of Organic Residues in Archaeological Pottery*

This paper presents results of a 2-year study examining the extent to which $\delta^{13}\text{C}$ values of adipose fats and dairy foods from sheep, goats and cattle are affected by the isotopic composition (13C/12C) of vegetation that the animals have been consuming. Compound-specific isotopic analyses (GC-C-IRMS) of carcass fats and dairy foods obtained from a range of ecological niches in the Middle East, Caucasus and western Central Asia have revealed that the relative amounts of C3 and C4 plants in animal diet significantly affect the $\delta^{13}\text{C}$ values of major fatty acids. Our results demonstrate that unambiguous identification of the source of animal fats surviving in archaeological pottery may not be possible

in many instances based solely on the δ13C values of extant lipids. This study also draws attention to the compelling need for development of new niche-specific analytical criteria capable of distinguishing between the δ13C values of non-ruminant and ruminant adipose fats and dairy foods from different regions of the world.

Gregonis, Linda

- [218] *When the Frontier Is the Center: Social Identity in the Tucson Basin*

As communities in the Tucson Basin developed and changed through time, they took on aspects of the cultures around them while creating their own unique identities. The ballcourt villages established along the Santa Cruz brought the Tucson Basin into the Hohokam sphere, but the Tucson Basin villagers did things with their own twist. By the A.D. 1000s, one can argue that the Tucson Basin had become a center of its own, pulling away from the influence of the Phoenix-Gila Basin Hohokam. The Tucson Basin people continued on their culturally distinct track well into the A.D. 1200s, integrating Mogollon-highland migrants into communities on the east side of the basin while maintaining strong relations with their southern and western neighbors.

Gregoricka, Lesley [190] see Williams, Kimberly

Greig, Karen (University of Otago)

- [68] *Kuri: The dogs of New Zealand Aotearoa*

Dogs were the first domesticated animal successfully introduced to New Zealand. They were brought to New Zealand by Polynesian colonists around 1300 AD, well in advance of the introduction of other domesticates in the 18th and 19th centuries. Dog bones are ubiquitous in many New Zealand archaeological sites, however, little is known about early dog populations and their interactions with people. As these dogs are now extinct, archaeological remains are an important source of information. This poster presents the preliminary results of archaeozoological and ancient DNA analyses of the dog remains from two early New Zealand sites, Wairau Bar and Houhora. Results indicate the composition and genetic history of some of New Zealand's first dog populations.

Greubel, Rand (Alpine Archaeological Consultants) and Kimberly Redman (Alpine Archaeological Consultants, Inc.)

- [152] *Pipeline Archaeology for the Public: Why It's Good for Everybody*

From the late 1990s to the present, Alpine Archaeological Consultants, Inc., based in Montrose, Colorado, has been involved with several large pipeline projects that included, in addition to traditional mitigation measures such as data recovery excavations, non-traditional mitigation involving public outreach. This paper provides a retrospective of the approaches to public outreach used on these projects, which have included popular books, development of public school curricula, interpretive signs and brochures, and multimedia programs, among others. The emphasis will be on describing the approaches, assessing their effectiveness, and explaining why such non-traditional mitigation is beneficial for archaeologists, the public, and private industry.

Griego, Anthony (Historic Researcher) and Dan W. DeLuca (Historic Researcher)

- [260] *Out of Sight - Almost Forgotten: The Historic Background of the First Catholic Church and Cemetery in New Haven, Connecticut*

The First Catholic Church and Cemetery in New Haven, Connecticut was established in 1834 and has been referred to as "the cradle of Catholicism in Connecticut." Both flourished and grew until a fire destroyed the Church in 1848. A new cemetery was established in 1853 and became the main burial ground. A

new Church was built in 1858 and the systematic (planned or unplanned) removal of the gravestones began. The last burial was in 1864 and the gravestone was placed in front of the Church. By 1898 all gravestones were removed, all identification of a cemetery had disappeared.

The property was sold to Yale-New Haven Medical Center in 1967. When the buildings were demolished, two human skulls were found in the landfill that came from this site. Anthony Griego, employed by Yale-New Haven Hospital, would tell co-workers about the forgotten cemetery. On July 11, 2011 he received a call that during the Emergency Department expansion a human bone had been discovered. Anthony responded to the site and impressed upon the responding police to call the State Archaeologist. An archaeological excavation discovered the intact remains of four human burials. Research determined that there were at least 608 burials at this site.

Grier, Colin [88] see Hopt, Justin

Grier, Colin (Washington State University)

- [170] *Research over the Longue Durée: Fifteen Years of Amesian Archaeology in the Southern Gulf Islands of British Columbia*

Over the span of Ken Ames's career, Northwest Coast archaeology has changed dramatically in its theory, methods and place in broader anthropological theory. A significant driver of these changes has been Ken's mapping out of a diverse range of problems for Northwest Coast and complex hunter-gatherer archaeologists to tackle. This presentation provides an introduction to the symposium, outlining the diversity of current scholarship that builds on Ken's work. My specific contribution involves presentation of a synthesis of 15 years of archaeological research in the southern Gulf Islands, focusing on the long term research that has taken place at precontact Coast Salish village sites on Galiano, Valdes and adjacent islands. This research has been shaped substantially by the focus on household archaeology, chronology building, and the emergence of social inequality developed throughout Ken Ames's writing. It also represents a long-term investment in the Dionisio Point locality, an approach which I argue is critical for generating the depth of understanding of social practices and social change necessary to account for the complex precontact history of the Salish Sea.

- [170] *Chair*

Griffel, David, James Moriarty IV (ADIA) and Martin McAllister (ADIA)

- [135] *The Chief's Mound Case: Forensic Archaeology vs. Mississippi Site Looters*

In March of 2012, Mississippi Department of Wildlife, Fisheries, and Parks officers arrested two individuals at a boat launch site on the Tennessee-Tombigbee Waterway after receiving a report they were looting a prehistoric archaeological site in the vicinity of the waterway. Their boat and pickup truck were searched incident to arrest and artifacts and digging tools were found. Further investigation determined the violation occurred at what is now referred to as the Chief's Mound Site on U.S. Army Corps of Engineers land a short distance by boat from where the suspects were arrested. Additional artifacts from the site were found when search warrants were served on the homes of the suspects and an artifact collector. Recognizing the need for specialized forensic archaeological assistance in support of the investigation, the Army Corps hired the firm of Archaeological Damage Investigation & Assessment to complete the evidence collection and documentation process at the site and to conduct the archaeological damage assessment for the effects of the violation. A summary of the case's investigative and assessment procedures involved provides a good example of the use of forensic archaeology in the protection of archaeological sites.

Griffel, David [135] see McAllister, Martin

Griffin, William

- [56] *A Few Interesting Results from the Matitanana Archaeological Project, Southeastern Madagascar*

Five field seasons of archaeological survey and excavation in the Antemoro region of southeastern Madagascar formed the basis for a recently completed doctoral dissertation at the University of Michigan. This brief talk will summarize the results, based on an analysis of the artifacts recovered and the settlement maps produced, concerning the rise of socio-political complexity and the culture history of the region. As is to be expected, new questions arose in the completion of this work that point the way forward for future archaeological projects in the area.

Griffin, P Bion (University of Hawaii)

- [64] *Grasshopper and Longacre: Debts in Building a Career in Hawaii*

I was a new, naive graduate student in the summer of 1966, engaged in my first archaeological field experience. I had survived one year of course work and had decided the "The New Archaeology" was close to God's truth. Luckily, Bill Longacre accepted my application to the Grasshopper field school. Grasshopper over the years of 1966-1969, finally as Assistant Director, gave me the needed foundation and Bill's style of teaching kept me thinking. I spent 37 years at the University of Hawaii, running field schools and doing archaeology in Hawaii, Tahiti, Samoa, the Philippines, Indonesia, and Cambodia. Most importantly, Grasshopper and Longacre introduced me to ethnoarchaeology, pointing the direction to my wife's, son's and my years of research among the Agta of the Philippines. The ghosts of Grasshopper continue to inspire conversations with Bill at the University of the Philippines Archaeology Studies Program and concerning my newest ethnoarchaeology, a study of elephant-human interactions in Southeast Asia with an eye to applications for understanding the ancient Khmer empire. What a field school, what a foundation!

Griffin, Laura (Cotsen Institute of Archaeology UCLA), Charles Stanish (Cotsen Institute of Archaeology UCLA) and Henry Tantaleán (Universidad Nacional Mayor de San Marcos)

- [235] *An Architectural Landscape Association between a Linear Geoglyph and a Paracas/Carmen Pyramid in the Chincha Valley, Peru*

In a recent survey of the pampas east of El Carmen, in Peru's upper Chincha valley, we discovered a large area (≈ 2.5 sq. km) of geoglyphs similar to the lines of Nasca, Palpa and other south coastal valleys. In this poster, we focus on one trapezoidal geoglyph that is architecturally associated on the landscape with a site known as Cerro del Gentil. Cerro del Gentil has a 5-meter tall adobe pyramid that was built in Paracas times. It also has a Carmen occupation. The trapezoidal geoglyph is located approximately 2 kilometers ESE of Cerro del Gentil and was positioned in such a way as to frame the pyramid as one descended down the valley from the highlands. Together, the site of Cerro del Gentil and its associated geoglyph constitute part of a single architectural complex that ritualized the entire pampa landscape together

Griffin, Andrew (University of California, Berkeley)

- [240] *A GIS and Lithic Analysis of Changing Domestic Practices in Late Paleolithic Pyrenean France*

During the Late Paleolithic, hunter-gatherers of the Magdalenian and Azilian periods in the Pyrenean region changed in ways both expected and surprising. With a generally warming environment after the Last Glacial Maximum and the eventual decline in large

herds of gregarious animals, it is probably not odd that groups would begin to broaden their subsistence base. However, artistic practices changed in dramatic fashion, with 'abstract' and geometric art for the most part replacing the mostly naturalistic art of the Magdalenian and previous periods. At the same time, the settlement patterns remain largely the same. Why did some aspects of hunter-gatherer life shift so markedly while others remained stable? My research attempts to explain these complex changes by examining the intra-site domestic practices of Late Magdalenian and Azilian groups through the use of GIS and a fine-grained lithic attribute analysis in conjunction with a practice theory framework. Practice theory can be used to bridge the gap that often separates technical methodologies like GIS and discussions of social relations through its focus on practical knowledge and habitual actions, i.e. real productive actions that have real effects on the physical and social environment.

Griffith, Sarah (Eastern New Mexico University)

- [85] *Faunal Resource Use through Time at the Fornholt Site, Mule Creek, New Mexico*

This poster reports on the analysis of a sample of the faunal assemblage from the Fornholt site, situated near Mule Creek in the Upper Gila region of southwestern New Mexico. This site had several occupation episodes beginning as early as A.D. 550 and continuing through the late 12th or early 13th century. Archaeology Southwest and the University of Arizona conducted test excavations at this site between 2009 and 2012. As part of my senior thesis research, I compared fauna from an early pithouse structure probably dating to the site's Classic Mimbres component with fauna from a later Tularosa Phase unit. I identified faunal specimens using a comparative collection from Eastern New Mexico University in Portales, New Mexico. My research examines the species compositions of the early and later components, comparing variability in species frequencies both within and between contexts and through time. This allows me to interpret the significance of different animal food species in the diets of Fornholt residents. It also allows me to track how resources changed through time in the area, providing insights into local and regional environmental changes through time.

Grillo, Katherine [225] see Rouse, Lynne

Grimes, Vaughan [20] see Guiry, Eric

Griset, Suzanne

- [102] *Native American Ceramics in Nineteenth-Century Los Angeles Basin*

The recent excavations of native ceramics from two early historic southern California sites—Mission San Gabriel and the Plaza area of the Pueblo of Los Angeles—provide related datasets on Native American and European ceramic traditions and how they interacted and evolved in the early- to mid-19th century. Many of the native peoples in the Los Angeles Basin and northwestward favored steatite vessels over clay, while those to the south and eastward into the desert had established ceramic traditions that were incorporated into the missions or modified by the introduction of the pottery wheel and by vessel forms better suited to European cuisine. The Plaza was originally settled by the Hispanic/African American/Native families sent there from Mission San Gabriel. Burial records from the Plaza church demonstrate that native peoples from throughout southern California relocated to the pueblo of Los Angeles and participated in the melded society. Analysis of the native ceramics focused on vessel form, manufacturing techniques, raw materials, and recovery context within and between each site, then contrasted the native ceramic assemblages with those of European manufacture, and with containers made from other materials.

Grocke, Darren [219] see Roberts, Charlotte

Groen, Mike (Netherlands Forensic Institute) and Roosje de Leeuw (Netherlands Forensic Institute)

[135] *Forensic Archaeology in the Netherlands*
 Forensic archaeology in the Netherlands is regarded a forensic discipline that uses archaeological theory, methods and techniques in a legal context. It applies and combines criminalistic, archaeological, geographical, pedological and ecological knowledge at a crime scene to document and interpret the encountered finds and features. Forensic archaeological cases entail survey for (buried) human remains or objects, recovery of fragmented and burned human remains above ground, excavation of a clandestine burial, exhumation in a regular cemetery and assessment and dating of skeletal material. Forensic archaeology in the Netherlands is based at the Netherlands Forensic Institute (NFI) in The Hague along with over thirty other forensic disciplines. The NFI is an agency of the Ministry of Security and Justice and provides services to clients within the criminal justice chain. Most forensic archaeological reports are written in accordance with the Bayesian theorem to express the most likely outcome. In addition, forensic archaeology at the NFI is concerned with the research and development of forensic archaeological field methods and techniques relevant to case work (GIS, search - and dating methods) and applied research in taphonomy.

Groleau, Amy (Colgate University)

[14] *Practicing Personhood: Enacting Social Relationships in the Wari Empire*
 Relational ontologies define personhood through the practice of meaningful and repeated interactions; that is, persons are those with whom we have relationships. This allows for recognition of non-humans as actors or agents in a way that the Western notion of a free-willed and self-contained individual does not. Non-human social actors are well-known for the contemporary Andes, and while it is generally accepted that these inclusive ontologies -- i.e., communities that recognize landforms, weather patterns, animals, plants, and substances among their members -- have roots in the pre-Columbian past, it is often bracketed as religious belief through propitiation rather than active constitution of a social world.

For residents of the Wari city of Conchopata, I argue that such relationships were enacted through cyclical interments of human bodies, animal bodies, and ceramic bodies within the floors and walls of domestic and workshop contexts. Rather than votive offerings, I suggest that these heterogeneous caches were embodiments of household engagement with within broader communities that included living humans and non-human persons.

Gron, Kurt (University of Wisconsin-Madison), Søren Andersen (Moesgård Museum) and Harry Robson (University of York)

[68] *Isotopic Evidence of Environmental, Subsistence, and Cultural Changes across the Mesolithic-Neolithic Transition at Havnø, a Danish "Køkkenmødding"*

Recent excavations at the shell midden at Havnø, Denmark, have yielded extensive faunal remains dating to both the late Mesolithic Ertebølle culture and the early Neolithic Funnel Beaker culture. Comprised of wild and domestic species, the faunal material is one of the largest early Neolithic assemblages from southern Scandinavia. In this study, fish, human, and mammal remains were analyzed for their bone collagen stable isotopic ratios of carbon and nitrogen to determine the extent, character, and intensity of changes across the Mesolithic-Neolithic transition at the site. Results indicate major changes in the protein component of human diet concurrent with the arrival of farming. Furthermore, similarity is seen in the environments in which domestic cattle and contemporary Neolithic wild deer were feeding. Our fish data suggest that eel and flatfish have carbon isotope signals

consistent with a marine origin whereas a single measurement of roach dating to the early Neolithic is evident of freshwater residency. Ultimately, these data yield important information about the local environment, diets, and cultural practices and lend insight into broader environmental changes during this period.

Grosman, Leore [190] see Goring-Morris, Nigel

Grosman, Leore (Institute of Archaeology, The Hebrew University), Uzy Smilansky (Institute of Archaeology, The Hebrew University), Avshalom Karasik (Institute of Archaeology, The Hebrew University) and Ortal Harosh (Institute of Archaeology, The Hebrew University)

[247] *3D Tools for Archaeological Artifact: Documentation, Classification, and Investigation*

The Computerized Archaeological Laboratory, at the Hebrew University of Jerusalem started to operate on January 1st, 2010. Its purpose is to harness mathematical and computational methods to support archaeological research, documentation and visualization. The laboratory is equipped with high precision scanners which provide digital three dimensional models of archaeological finds. We concentrated on ceramic and lithic artifacts, and developed several tools and algorithms which are used routinely as the standard procedure for their analysis and publications. The presentation will summarize the main novel features which are used routinely in our laboratory:

- 1) Efficient, high precision data acquisition using 3D scanners.
- 2) Stable and reliable algorithms which automatically finds the symmetry axis of pottery fragments and an intrinsic positioning of lithic artifacts.
- 3) User friendly interface which creates print quality drawings of the objects.
- 4) A new procedure for automatic typology and classification of shapes, which is based on mathematical representations of morphology.

These four steps of documentation and analysis are now the routine tasks in the lab. So far we have successfully tested the procedure for more than 15,000 ceramic fragments and 2000 lithic artifacts from a large variety of archaeological excavation.

Grossman, Kathryn (University of Chicago)

[3] *The Protracted Process of Urbanization at Early Bronze Age Hamoukar, Syria*

Hamoukar was one of the largest urban centers in northern Mesopotamia during the Early Bronze Age. The settlement expanded to its largest extent during the late Ninevite 5 period (ca. 2500 B.C.) and was eventually abandoned several hundred years later. Results of excavations in Hamoukar's lower town between 2006 and 2010 now show that, during its life span, the city experienced profound changes in economic organization, particularly in the realms of ceramic production, subsistence, and administration. This paper examines these changes in light of current models of urbanization and urban economy. It argues, based on the evidence from Hamoukar, that transformations in economic organization commonly assumed to be a driving force in the urbanization process may, in fact, be secondary developments.

Grossman, Tiffany [206] see Stafford, C.

Grote, Mark [204] see Foin, Jeremy

Grove, Matt (University of Liverpool)

[215] *Periods of Reduced Environmental Variability May Act as Windows for Hominin Dispersal*

Theoretical biologists have long studied the nature of evolution in

fluctuating environments. Some of their findings chime with the more recent notion of 'variability selection'. Among the most important of these is the statement that temporal environmental heterogeneity is more likely to lead to behavioral flexibility than is spatial heterogeneity. This statement, when applied to hominin evolution, suggests that the behavioral flexibility accumulated during periods of temporal heterogeneity in a given region might be used to expand into neighboring regions during periods of lesser temporal flexibility. In effect, such behavioral flexibility is used to buffer against spatial heterogeneity encountered during expansion. This scenario for hominin dispersals is assessed using high resolution paleoclimatic data and estimates of dispersal rates of various hominin taxa. Results suggest that, whilst the scenario fits some dispersal events, it is less successful in describing others. Tectonic effects, geographic barriers, and missing data are discussed as possible factors. In some cases the scenario helps to adjudicate between alternate hypotheses, filling in vital information about the tempo of hominin dispersal. In others, it appears that other, more parsimonious scenarios must be formulated.

[215] *Chair*

Grover, Margan (Bold Peak Archaeological Services)

[276] *Cultural Continuity and Archaeological Extinction along the Beaufort Sea Coast, Alaska*

Environmental shifts in the Arctic National Wildlife Refuge, Alaska, have garnered attention in biology, glaciology, geology, and other natural sciences. But what about changes to the human environment? Beginning in 2010, the Corps of Engineers Alaska District and the Native Village of Kaktovik (a federally recognized tribe) began a partnership to document impacts of coastal change to cultural resources within Kaktovikmiut territory. While the Tribe is generally alarmed with erosion, thermokarst, and other impacts of climate change, their greatest concern is the loss of archaeological sites, burials, and seasonal camps. We collected coastline data and mapped cultural resources, then compared it to traditional knowledge and archaeological survey data from the late 1970s-80s. About one-third of sites had disappeared in the last 30 years, and another third had some loss of features or were affected by wind- and storm-driven water or sand. Almost all of the remaining resources were threatened by wind and storm-driven waves or thermokarst.

Groves, Sarah [219] see Roberts, Charlotte

Gruber, Thomas (University of Oklahoma)

[175] *Identifying Workgroups in Classic Mimbres Villages (A.D. 1000-1150) in Southwestern New Mexico*

This research examines the identification and transformation of social boundaries in the Mimbres Region using painted Classic Mimbres ceramics. Specifically, this work is about social boundaries and how people organize themselves during the production of material culture. This study builds on Steven LeBlanc's (2004) hypothesis that Mimbres pottery was made by only a few people that possessed the technical mastery to create the regularity of finely crafted ceramics produced during the Classic period. The aim of this paper is not to understand the size of production groups, but rather to understand the spatial organization and relationship of ceramic production groups in the Mimbres region during the Classic period. Using LeBlanc's (2004) idea that production groups can be identified by using microstylistic differences in the painted designs of Mimbres pottery, I focus on the microstylistic differences of two geometric motifs found on Classic Mimbres Bowls. The differences in the production of the zigzag and step motifs are used to identify production groups at five Mimbres villages. The expectation of the microstylistic study is that it will show that larger villages have less spatially definable social boundaries between ceramic production groups than the smaller villages.

Grun, Rainer [11] see Benson, Alexa

Grundtisch, Katie (Washington State University), Scott Ortman (Crow Canyon Archaeological Center), Timothy Kohler (Washington State University) and Carly Fitzpatrick (Washington State University)

[16] *Population Dynamics and Warfare in the Northern Rio Grande Region*

We examine the relationship between population size and warfare (interpersonal violence) in the archaeological record of the Northern Rio Grande region of the U.S. Southwest. The analysis of interpersonal violence is based on frequencies of certain trauma to human bone, following methods developed by Sarah Cole (2007, 2012), which allow us to examine the goodness-of-fit of these data to Turchin and Korotayev's (2006) model of a non-linear, dynamic relationship between population and warfare. We compare our results to those of Cole's previous findings for the central Mesa Verde region, and to other hypotheses concerning conflict in the U.S. Southwest and worldwide.

Grunwald, Allison (University of Wyoming)

[263] *What Was in the Caches? Evaluating Frozen Marrow Storage through Bone-Breakage Experiments*

Understanding bone biomechanics and their effect on bone-breakage patterns leads to a more objective interpretation of human subsistence activities. While ethnoarchaeological research has provided information regarding the structure of frozen meat caches, much less is known regarding the storage of marrow along with meat, and if bones were thawed prior to marrow extraction. This study reports the results of experiments performing hammerstone bone-breakage on frozen and thawed cattle femora with the periosteum and a thin layer of meat left intact. Results indicated that both the presence of soft tissues and the frozen or thawed state of the bone influenced the extent and type of fracture. These differences potentially allow for the objective identification of frozen and thawed marrow-cracked bones from an archaeological assemblage. This research has implications for interpreting winter subsistence activities on the North American Plains.

Guanghui, Dong (Lanzhou University), Chen Fahu (Key Laboratory of Western China's Environmental System), Wu Xiaohong (School of Archaeology and Museology, Peking University), Zhao Zhijun (Institute of Archaeology, Chinese Academy of Social Sciences) and Jia Xin (Key Laboratory of Western China's Environmental System)

[179] *A Comparative Study of Radiocarbon Dating Charcoals and Charred Seeds from the Same Flotation Samples in Neolithic and Bronze Sites in the Gansu-Qinghai Region, China*

Chronologies of Neolithic and Bronze cultures in ancient China are mainly based on radiocarbon dates from charcoals, which are probably inaccurate due to the inbuilt errors (tree rings) in those charcoals. Here we report the comparison between the radiocarbon dates of short-lived charred seeds and those of charcoals from same flotation samples in 19 Neolithic and Bronze sites in Gansu and Qinghai Provinces, China, in order to examine the inbuilt errors of radiocarbon dates in charcoals. The results shown that uncalibrated radiocarbon dates of charcoals are older than those of charred seeds in 17 flotation samples, the differences ranging from 780 to 14 years with an average difference of 156 years. In the other two flotation samples, uncalibrated radiocarbon dates of charcoals are 45 and 8 years younger than those of charred seeds, respectively; however, these values lie within the error range of radiocarbon dating. Our work suggests that the inbuilt errors of radiocarbon dates in charcoals should be considered when discussing the chronologies of Neolithic and Bronze Age cultures, and more radiocarbon dates are required from short-lived charred seeds in order to determine

the chronologies of prehistoric cultures.

Gudiño, Alejandra [165] see Lippi, Ronald

Guerre, Lisa (URS Corporation/Catalhoyuk Research Project)

[9] *Finders, Keepers: Collections Management Practices at the Catalhöyük Research Project*
Archaeological projects, like museums, must guarantee proper management, preservation and use of collections and facilitate research through a clear knowledge of project holdings. The Catalhöyük Research Project currently holds approximately 131 m³ of artifactual material with a growth rate of around 7 m³ per year. To ensure access to the abundance of material, and to support the various research initiatives of over 120 specialists with over 35 distinct specialisms, rigorous collections management is key. A collections management program based in museum registration and archival management best practices has been implemented at The Catalhöyük Research Project. Project Finds Officers, in collaboration with a diverse project staff, have developed a system which focuses on physical accessibility and emphasizes the timely and accurate tracking of all materials. This poster centers on how the collections database works to uphold the most precise record of material, from both current and past excavations, through newly established tracking devices and functions within specialist database interfaces. It highlights developments in both the physical and digital maintenance of the collection with emphasis on accessibility and sustainability and illustrates the utility of the system in building diverse datasets as the project works towards envisioning Catalhöyük.

Guerrero, Marcos

[174] *Tribal Consultation: In Search of a Meaningful Good Faith Effort*
Native American government-to-government consultation with agencies is often one of the most challenging aspects of Tribal Preservation. Whether it is learning the acronyms, about regulatory compliance, mitigation planning for adverse effects, or conflict resolution, it is often difficult to navigate through this process. The United Auburn Indian Community of the Auburn Rancheria is actively engaged in exercising its Section 106 oversight and review authority off tribal lands. This includes concurring on a project's Area of Potential Effect, survey results, research design, and resource evaluations. What has helped with consultation in the past has been the Tribe's sovereignty to intervene when there are serious concerns and the relationships with participating agencies; what hasn't worked is having the same level of respect, oversight and authority as the SHPO; and what can be improved upon is having resources reported to the state clearinghouse and actual government-to-government consultation. I will discuss specific examples from consulting with local, state and federal agencies in Central California to address these points.

Guilfoyle, David (Applied Archaeology International), Myles Mitchell (Applied Archaeology International; Australian Nati) and Ron 'Doc' Reynolds (Gabbie Kylie Foundation)

[165] *Sustainable Indigenous Heritage Management and the Role of Archaeology: A Working Model and Case Study from Western Australia*

This paper explores the positive outcomes when combining research, education, and public programs with Traditional Owners, land managers, and heritage professionals. A holistic approach to cultural heritage management is developing over time in the southeastern region of Western Australia to situate the local Traditional Owner community at the center of heritage management. A structure has been established to allow a community-based approach to project development and implementation, and has led to the successful completion of a number of large-scale conservation and management projects, within a wide-ranging research and community development

program. We look at the successes and ongoing challenges in a critical reflection of this model and its implications for the broader field of community-based cultural heritage management. The paper outlines a working model and reviews the role, and integration of, various fields of archaeology within this holistic program.

[221]

Discussant

Guillaume, Levavasseur [215] see Burke, Ariane

Guiry, Eric, Colin Smith (Archaeology Program, La Trobe University, Melbourne), Vaughan Grimes (Department of Archaeology, Memorial University, St) and Domingo Salazar-García

[20] *Dogs as Dietary Proxies for Humans in the Spanish Copper Age: A Case Study Using Bulk and Compound Specific Stable Carbon Isotope Analyses*

Dog (*Canis familiaris*) remains can potentially provide a proxy material for their human keepers in stable isotope-based paleodietary reconstructions when human remains are unavailable for analyses. This 'Canine Surrogacy Approach' (CSA) has been used as a method for reducing reliance on direct analyses of human remains. Most CSA applications have been conducted on an ad hoc basis and few systematic analyses of the degree to which dog stable isotope signatures reflect those of humans have been conducted. This paper compares bulk stable carbon and nitrogen isotope ratios from dog (n=20) bone collagen to those of previously analyzed humans (n=118) from the same mass burial at the Spanish Copper Age site of Camino del Molino. Dietary similarities demonstrated through bulk stable isotope analyses prompted a higher resolution analysis of the ways in which a subset of human (n=10) and dog (n=5) diets converged by comparing the stable carbon isotope ratios of individual amino acids via LC-IRMS. Results suggest that dogs in this and potentially similar contexts can provide suitable, albeit rough, proxies for their human keepers.

Gulløv, Hans Christian (National Museum of Denmark)

[271] *Hope Colony and Neu Herrnhut: Studies of Mission and Inuit Settlement Patterns in Eighteenth-Century Greenland*

Archaeological excavations of the first European mission and trade station, the Danish-Norwegian 'Hope Colony' (1721-1728), and of the competing mission station, the German 'Neu Herrnhut' (1733-1900) are presented. Their different layout mirrors the objectives of mission activities. The Danish Lutheran Church missionized traveling among the Greenlanders along the coast, while the pietistic German Brethren proselytized at their stations. Placed in Inuit land, the European colonies became attractive to the Greenland hunting communities of the Inuit who themselves changed their dwellings structure and settlement patterns when traveling from remote places to the European centers in central West Greenland. Changes in Inuit societies will be part of the presentation drawing from archaeological, historical, and ethnohistorical sources and from the oral traditions taken down by missionaries and merchants.

Gumerman, George (Northern Arizona University) and Joelle Clark (Northern Arizona University)

[67] *Hopi Footprints: Guided along the Path of Cultural Preservation by Leigh Kuwanwisiwma*

Leigh Kuwanwisiwma's leadership helped make the long-term Hopi Footprints program a success. The primary goal of the program is to connect Hopi youth with elders and their ancestral past by learning about Hisatsinom footprints, the archaeological sites and the oral history that surrounds them. At the request of Leigh, the program developed as a collaboration between the Hopi Cultural Preservation Office and Northern Arizona University.

Leigh's passion and knowledge have pushed us to continually evolve and improve upon the project. Over the past 10 years, the program has affected over 100 Hopi youth, teachers, elders, and Hopi families. Because of Leigh's inspiration, Hopi youth have opportunities to visit ancestral sites, speak with elders and archaeologists directly about their heritage, learn about Hopi life and culture in school, and produce digital artifacts as evidence of what they learn. Leigh's support for and commitment to the Hopi Footprints program is Hopi cultural preservation.

Gunchinsuren, Byamba (Mongolian Academy of Sciences)

[31] *Discussant*

Gunchinsuren, B. [222] see Gillam, Christopher

Guo, Wu and Enguo Lv

[179] *Rethinking Questions of Chronology in Ancient Xinjiang*

There are many questions surrounding chronology in ancient Xinjiang. In this meeting, the author will discuss those situations in detail and will give some advice for improving the chronology of ancient Xinjiang, including some investigations of the Yanghai cemetery carried out by the author.

Gupta, Neha (Lakehead University)

[29] *Geopolitical Concerns, National Interests, and the Case of Sanghol in Indian Archaeology*

Scholars studying the practice of archaeology in post-colonial societies, such as India, overlook the relationship between local communities – where archaeological field investigations often take place – and state-oriented institutions in archaeological research. In this paper, I discuss field studies in the community of Sanghol, Punjab, India, where, between 1985 and 1990, the Archaeological Survey of India (Survey) – the national department for archaeology and heritage management – carried out excavations with the Punjab State Department of Archaeology and the local community. Excavated in the wake of Prime Minister Indira Gandhi's assassination by her Sikh bodyguards, and amid intense competition for sovereignty in Punjab, I demonstrate that geopolitical concerns and the desire for political stability influenced where and when Indian archaeologists excavated and the evidence they deemed acceptable. It is in this context that B. M. Pandey, the former director of the Survey, called Sanghol "one of the most important sites not only in the Punjab but in the subcontinent".

[29] *Chair*

Gupta-agarwal, Sonali (UCLA)

[129] *Continuity or Change? Transmission of Pottery Skills in Egypt and India to Understand Archaeological Ceramics at Karanis, Egypt*

Pottery has long since served the role of defining chronology and giving a temporal dimension to human lives. This paper focuses on concretizing the role of pottery workshops in influencing continuity and change by incorporating competing theoretical approaches allowing transmission to retain its dynamic role in teaching and learning of skills. I approach transmission through Bourdieu's 'habitus,' focusing on the interactions between the individual and collective. The collective represents a community of practice, i.e. a pottery workshop, transmitting a certain tradition of teaching and learning. Apprenticeship in these workshops conveys these traditions and allows enculturation. The workshop then bears a signature which cannot be replicated beyond this specific domain, leaving 'markers' on the vessels which become evidence of the agency. Preliminary fieldwork was conducted in modern day pottery workshops of Egypt and India, both with a long tradition in pottery manufacturing. The approach has allowed me to focus on micro-variables to understand the larger framework. In this paper I

shall demonstrate through experiments that it is indeed possible to understand archaeological ceramics in new light by adopting this theoretical and methodological approach.

Gurova, Maria (National Institute of Archaeology and Museum, BAS, Bulgaria), Clive Bonsall (School of History, Classics and Archaeology, Unive), Bruce Bradley (Department of Archaeology, University of Exeter, U) and Elka Anastassova (National Institute of Archaeology and Museum, BAS,)

[227] *Experimental Approach to Prehistoric Drilling and Bead Manufacturing*

From the very Early Neolithic in the Balkans two categories of objects are recognized as having been involved in prehistoric drilling activities: beads and other decorative and prestigious items made of bone, shell, pottery and various minerals, and toolkits of flint micro-borers. This paper discusses experiments in drilling different materials undertaken with the aim of testing several practical issues. A series of flint micro-borers were produced and used for manual and mechanical drilling (with a pump drill) of various samples (mainly prepared thin plates) of minerals and rocks, ranging in hardness (on Mohs scale) from 3 (marble, limestone, calcite) to 6.5 (amazonite, nephrite). Biominerals were also used in the experiments: aragonite (shells) and apatite (bones). Our initial attempts at bead production involved the manufacture of 16 delicate beads from 5 different materials using fine sand and water abrasion. Though not conclusive, the experimental work is instructive in many of the parameters, procedures and technical details of prehistoric drilling and bead manufacturing. The experience gained has led to a more holistic interpretation of archaeological drilling toolkits, as well as a better appreciation of the particular skills and know-how of the prehistoric jewelry makers.

Gürsan-Salzmann, Ayse [30] see Miller, Naomi

Gurtov, Alia (University of Wisconsin - Madison) and Metin I. Eren (University of Kent)

[148] *An Experimental Examination of Lower Paleolithic Toolstone Constraints at Olduvai Gorge, Tanzania: Quartz, Basalt, and Bipolar Reduction*

Lithic raw material constraints are widely assumed to be a determining factor of flaked stone tool morphology and efficiency, but recent archaeological and experimental results demonstrate this factor often has negligible effect. In this poster we build on these recent studies by presenting a pilot experiment that compares the effects quartz and basalt toolstones have on the efficiency of bipolar production. Our preliminary results speak directly to hominin raw material selection, technology, and composition of archaeological assemblages at Olduvai Gorge, Tanzania, where our actualistic field experiments were conducted.

Gusick, Amy (University of California, Santa Barbara)

[220] *Patterns of Lithic Reduction and Mobility during the Early Holocene on Santa Cruz Island, California*

Raw material resources for prehistoric tool production on Santa Cruz Island, California are found in numerous regions across the island. Volcanic stone found in the Santa Cruz Island Volcanics formation is relatively abundant around the island; however, chert, an important toolstone for island inhabitants throughout time, is found only in the Monterey Formation on the eastern end of Santa Cruz Island. Data from the five known Early Holocene sites on the island has shown that the restricted location of this chert likely influenced variation in technological organization occurring at Early Holocene sites both near and distant from the concentration of chert resources on the eastern end of the island. These data also show that the location-restricted chert resources affected hunter-gatherer mobility and settlement decisions starting from the earliest known island occupation approximately 10,000 years ago.

This research adds to the broader understanding of technological development throughout the early occupations on California's Northern Channel Islands.

Gust, John [277] see Mathews, Jennifer

Gustas, Robert (Humboldt State University)

[213] *Dos Hombres to Gran Cacao: A Geospatial Habitation Suitability Analysis*

This paper presents a geospatial analysis which has allowed for an in-depth systematic and statistical analysis of the Dos Hombres to Gran Cacao Archaeology Project (DH2GC). By quantitatively analyzing the spatial characteristics of settlement and resources using Geographical Information Systems (GIS) based modeling, this paper explores the factors influencing variability among settlement patterns. The author created a habitation suitability index using GIS which identifies and displays areas more likely to be settled based of several types of recorded data. This analysis serves the functions of helping researchers to identify areas more likely to yield significant results during survey and excavation as well as revealing important trends in the locations of these resources. The results of this analysis reveal findings, which would not be readily apparent through traditional methods and shows the analytical power of GIS in archaeology.

Gutierrez, Gerardo [126] see Hernandez, Alicia

Guyah, Timothy

[126] *The Spatial Distribution of the Mexica Knife in Postclassic Mesoamerica*

Mexica knives are defined as large, thin, bifacially chipped, longitudinally asymmetrical knives with a short pointy base and a large leaf-shaped blade with (usually) convex edges. This artifact designation comes from the ancestral name of the Aztec because its distinct morphology is hardly present in Mesoamerica prior to the Mexica emigration into the valley of Mexico; furthermore, these knives are abundantly found in ceremonial contexts associated with the Postclassic Mexica and Aztec. As far as I have researched, Mexica knives were not duplicated by any other culture in Postclassic Mesoamerican prehistory except the contemporaneous Maya. Since the Mexica knife is a key part of the Mexica creation lore and it remains a dominant theme in Aztec culture and religion, then it is reasoned that splinter groups of the Aztec/Mexica continued to practice their religion and thus produced Mexica knives when occupying foreign territories. Conversely, Aztec/Mexica-influenced cultures may have produced Mexica knives in some capacity. The Mexica knife has a wide geographic distribution in Mesoamerica, ranging from the Basin of Mexico to the Yucatan and Guatemala.

Haak, Wolfgang [272] see Llamas, Bastien

Haas, Jennifer [25] see Picard, Jennifer

Haas, Jennifer

[25] *Middle Woodland in Southeast Wisconsin: Ceramic Composition at the Finch Site*

Recent excavations at the Finch Site (47JE902), a multicomponent habitation in southeastern Wisconsin, yielded diagnostic ceramic wares indicative of participation in Hopewell exchange systems. Havana-influenced styles present at the Finch site include Havana Zoned, Naples Stamped, and a type similar to Sister Creeks Punctate. These types occur alongside local wares such as Kegonsa Stamped and Shorewood Cord-Roughened. Compositional analysis was conducted on these vessels using a portable X-ray fluorescence analyzer (pXRF). Collectively, these

analyses provide insight into the manufacture and distribution of Middle Woodland ceramic styles at the Finch site. Further, the data from the Finch site is compared to existing regional compositional analysis data sets to address inter- and intra-regional interaction during the Middle Woodland period in southeastern Wisconsin.

Habicht-Mauche, Judith (UC-Santa Cruz) and Suzanne Eckert (Texas A&M University)

[267] *Sourcing Western-Style Glaze-Painted Pottery from Tijeras Pueblo, NM*

The decorated ceramic assemblage from the fourteenth century site of Tijeras Pueblo (LA581), located just east of Albuquerque, New Mexico, is characterized by more than 20% of Western-style glaze painted pottery, similar to types produced in the Acoma and Zuni areas. We present the results from our petrographic and INAA analyzes of samples from this assemblage and argue that "Western-style" vessels are a mix of imported and locally produced wares. These results have implications for understanding processes of inter-regional migration, settlement aggregation and identity formation among the Eastern Pueblos during the late precontact period. Specifically, we use the concept of "creolization," as developed by historic archaeologists studying colonial contact, to model identity formation in the context of a probable migration of Western Pueblo peoples into central Rio Grande communities, such as Tijeras, during the late thirteenth and early fourteenth centuries.

Habicht-Mauche, Judith [267] see Eckert, Suzanne

Habu, Junko (University of California Berkeley)

[170] *Food Diversity and Long-Term Sustainability: Lessons from Prehistoric Japan*

One of the central themes of Ken Ames' work is complex hunter-fisher-gatherer intensification. This presentation focuses on the mechanisms of settlement growth and decline in complex hunter-gatherer-fisher societies of prehistoric Japan in relation to food diversity, mobility of people/goods/information, technological developments and climate change. Early and Middle Jomon (ca. 6000-4000 years ago) archaeological data from northern Japan indicate that the loss of food diversity and an expansion of the scale of society may have negatively affected long-term sustainability of these hunter-gatherer societies. Through the examination of this case study, it is argued that archaeology is critical in our understanding of long-term human-environmental interactions.

Habu, Junko [258] see Craig, Oliver

Hackenberger, Steven and Tricia Gabany-Guerrero (California State University Fullerton)

[237] *An Early Crossroads in Mesoamerican Culture, Parangaricutiro, Michoacan, Mexico*

Ongoing investigations, in partnership with a Purépecha community, are making discoveries related to the origins of their highland culture. The Late Archaic burial in the La Alberca Rockshelter (ca 4500 BP) provides the earliest evidence of dental and cranial modification in highland Mexico. Associated rock images provide a ritual context of power and authority. The burial and other local sites are set within geographic context of major symbols of sacred power. Fieldwork outside of the La Alberca caldera includes the mapping of mound-like structures and large rock structures with charcoal dates ranging from 4000 to 6500 BP. Significant discoveries at other nearby sites include evidence of Classic and Post-Classic Period households and urn burials.

[237] *Chair*

Hackenberger , Steven [237] see Drozdowski, Jarod

Haddow, Scott (Cranfield University), Christopher Knüsel (Exeter University), Joshua Sadvari (Ohio State University), Nicolò Dell'Unto (Lund University) and Maurizio Forte (University of California Merced)

[9] *Bioarchaeology in 3D: Three-dimensional Modeling of Human Burials at Neolithic Çatalhöyük*

This poster showcases one example of the integrative work undertaken by members of the Çatalhöyük Research Project, specifically the bioarchaeologists who excavate the human remains found on site and the researchers responsible for digitally modeling and recording the site's archaeological contexts. Archaeology, by its nature, is a destructive enterprise, and the use of three-dimensional technology in the modeling of human burials can provide a permanent and interactive record of context, one that can be valuable for interpreting the sequence of archaeological events and that can be shared among present and future researchers. Using 3D models developed during the excavation of Space 77 in the North Area of Çatalhöyük, we demonstrate the power of these tools in two ways: 1) visualizing the sequence of interment events in a context dense with human remains, including eight individual burials and a multitude of disarticulated bones, and 2) interpreting the behavior of the ancient inhabitants of Çatalhöyük, including the post-interment retrieval of one individual's cranium and mandible. The broad adoption of 3D modeling techniques for human burials can greatly enhance the way bioarchaeologists engage in research and present their findings to the wider scientific and public communities, thus strengthening the discipline as a whole.

Haddow, Scott [32] see Carter, Tristan

Hadel, Patrick, Joan Schnieder PhD (Anza-Borrego Desert State Park) and Rusty Stone (Anza-Borrego Desert State Park, Shoshone-Piaute N)

[265] *Toward a Cultural Heritage Management Program for Ikh Nart Nature Reserve, East Gobi Province, Mongolia: A Pioneer International Effort Based on the California State Parks Cultural Resources Preservation Model in the Eastern Gobi Desert of Mongolia*

Since 1989 Mongolia has undergone drastic social and industrial changes that have resulted in threats to its Cultural Landscape. Two centuries of suppression of their cultural identity by foreign occupations has brought the Mongolian people to the point where they have become adamant about understanding and protecting their cultural heritage. In 2010, an international partnership between Ikh Nart Nature Reserve, California State Parks, the Earthwatch Institute, and the Denver Zoological Foundation, began. The goal was to develop and implement a plan to manage and preserve cultural heritage resources within Ikh Nart, one of the 147 protected areas in Mongolia. The international team included archaeologists, cultural resource managers, and interpreters, and from California State Parks, Anza-Borrego Desert State Park, the Mongolian Academy of Sciences Institute of Archaeology, and Earthwatch Volunteers from around the world. Included are elements of developing a recording and evaluation data base, building a system of public outreach and education using group-training classes, heritage preservation literature dissemination, and cross-cultural communication with California Native People. This is a pilot project testing the feasibility of transferring elements of a successful cultural resources management program to newly protected areas in Mongolia and in other countries with emerging economies.

Hadley, Alison (University of Kansas)

[124] *An Experiment in the Replication of Pipe Tools*

Ethnographic analogies are more common than experiments in the interpretation of prehistoric pipes. Although experimental archaeology is rare, it can be a productive way to understand the behaviors that produced the archaeological record pertaining to pipes. In the study presented here, chipped stone pipe tools were replicated and used to saw, drill, and engrave red pipestone. The resulting experimental collection aided in the identification of pipestone wear and residue on stone tools from Great Bend Aspect sites in south-central Kansas. This replication was one facet of a larger research project, which also combined lithic, use-wear, residue, and mineralogical analyses to delineate the organization of red pipestone pipe technology at four contemporaneous sites. The results will be used to identify the social and economic roles of red pipestone pipes. Ethnographic interviews will also be incorporated to determine how and if these roles changed over time.

Haeusler, Werner [183] see Wagner, Ursel

Hageman, Jon (Northeastern Illinois U), Kelsey Nordine (Washington University) and David Goldstein (National Park Service)

[103] *Creating a Digital Archaeobotanical Reference Guide*

A 2009 survey of practicing archaeobotanists indicates that the absence of basic plant and online seed and plant part identification databases are primary obstacles to archaeobotanical research in Latin America. In cooperation with the Department of Botany and the Searle Herbarium of the Field Museum of Natural History, we are creating an online image database of over 1400 plant species used by ethnographically-known lowland Maya populations. This database includes voucher specimens and closeups of reproductive organs and woody plant parts. The database was developed concurrently with our ongoing field research on Late Classic Maya plant use in northwestern Belize. Our paper reviews procedures used for imaging, illustrates the function of the database/atlas, and demonstrates its use. The online resource will be offered free of charge to the public, and will be supplemented by a published atlas with more complete ethnobotanical information and a bibliography.

Hager, Lori [248] see Schneider, Tsim

Hagerman, Kiri (UCSD)

[290] *Hide and Seek: Children in Ancient Maya Art and Iconography*

Historically, archaeologists have taken an elite-centric approach to the study of ancient Maya society. It has only been in the last two decades that researchers have become concerned with incorporating "invisible populations"—such as commoners and women—into the discussion of how ancient Maya society was structured. One population that continues to be overlooked—only recently coming under investigation—is ancient Maya children. Their exclusion from scholarly debate is due to a number of reasons, including our own Western beliefs about childhood and the conspicuous near-absence of children in Maya art and iconography. This paper examines the few instances of the depiction of human children in monumental Maya art, and suggests that the increase in the number of images towards the end of the Classic period is connected to the changing political situation and the weakening nature of Maya rulership. In times of political turbulence and incertitude, including royal children and heirs in political imagery publicizes and strengthens the line of succession.

Hahn, Randy (McGill University) and Arturo Rivera (Pontificia Universidad Católica del Perú)

[285] *Local Ideological Practices and Provincial Administration in the Chimú Empire*

Our paper discusses how local ideological practices were

implemented in the establishment and maintenance of power relations between the Chimú Empire, a pre-Columbian polity of Peru's North Coast, and their provincial subjects in the Jequetepeque Valley. Utilizing data obtained from recent excavations conducted at the Late Intermediate Period settlement of Huasi Huaman, we argue that the arrival of the Chimú created new avenues for political advancement for local leaders willing to serve as intermediaries between the inhabitants of the valley and the imperial Chimú. These leaders innovatively incorporated Chimú material symbols of power into ideological practices that emphasized local ritual traditions centered on platform architecture that involved the festive consumption of food and drink produced from symbolically imbued crops grown within the settlement. In this way, provincial subjects residing at settlements such as Huasi Huaman used Chimú symbols as an alternative marker of status without attempting to portray themselves as Chimú elites. The Chimú Empire, on the other hand, ensured that local leaders were dependent on their administrators as the source of prestige goods while gaining access to the substantial resources of the Jequetepeque Valley without having to substantially reorganize the existing administrative infrastructure.

Haile, James [263] see Bunce, Michael

Haines, Dr. Helen [109] see Gonzalez, Toni

Halcrow, Sian (University of Otago, New Zealand)

[219] *Endocranial Lesions in Infants and Children from Prehistoric Southeast Asia: Evidence for a Decline in Health with the Intensification of Rice Agriculture*

This paper considers endocranial lesions as a non-specific indicator of stress in infants and children in a series of samples from prehistoric Southeast Asian archaeological sites distributed over 2,500 years. Previous research has suggested that the intensification of agriculture, particularly during a period of intense social and environmental change in the Iron Age, led to a decline in population health. Our aim is to assess whether or not the endocranial lesions are consistent with a change in health over time in the region. We also consider whether the observations contribute to understanding the pathogenesis of the lesions in this sample. The higher prevalence of endocranial lesions at the Iron Age site of Muang Sema is consistent with an increasing exposure to infectious pathogens. Two grades of lesions were present only in the youngest infants, suggesting that these may have been a part of the normal bone growth process, or an early stage of pathology, which produces remodeling and capillary lesions. Children older than two years were more likely to have capillary lesions, indicative of pathology and chronic stress.

[74] *Discussant*

[219] *Chair*

Halcrow, Sian [219] see Buckley, Hallie

Hale, Micah (Dudek)

[11] *Stable Social Institutions Provide Context for Group Selection among Hunter-Gatherers*

The time minimizing-energy maximizing (Tmin-Emax) model describes two adaptive strategies that have widely divergent socioeconomic goals that are reinforced by stabilizing social institutions. Rather than transforming from one to another with changing techno-environmental conditions, as foragers and collectors should do in popular models of behavioral continua, Tmin and Emax economies are characterized by divergent response to such things as technological innovations, or diminishing returns. In this model, individual decisions are governed by social rules that define the allocation of scarce

resources according to established economic preferences. Selective forces can operate on these stable preference structures leading to differential success of each kind of adaptive strategy (i.e., selection operating at the group level). I examine this process among hunter-gatherers of southern California and discuss the implications for anthropological theory.

Hall, Allan [172] see Radini, Anita

Hallgren, Fredrik (Uppsala University, Sweden)

[258] *A Grinding Halt: On the Western Boundary in the Spread of Early Hunter-Gatherer Pottery in Fennoscandia*

The centuries around 5000 BC knowledge and know-how of ceramic technology was transmitted among hunter-gather groups living in the eastern Baltic Sea region, up to and including the coast of the Barents Sea in the far North. The swift spread and adoption of pottery craft in a region stretching from North-Easternmost Norway in the North to Northern Poland in the South is remarkable. Equally remarkable is the fact that the spread came to a grinding halt on the borders of the Scandinavian peninsula. Thus a western boundary was created in the use and production of early pottery, a technological boundary that were to remain for millennia. This study focus on three specific regions where hunter-gatherers with pottery lived closed to and interacted with hunter-gatherers without pottery (the Åland archipelago in the Baltic Sea, the Kalixälv river valley, and the Varanger fjord on the Barent Sea coast). It is suggested that the new technology was transmitted through a far-reaching social network, and that the boundary of the spread was dependent on the local social configurations at these specific points in the network. History and cultural identity is seen as factors influencing the choice to adopt or reject the new technology.

Hallinan, Emily [28] see Mackay, Alexander

Halliwell, Ally

[7] *Chair*

Halmbacher, Alexandria (University of Colorado)

[210] *Wait until You See What We Didn't Find: Interpreting Cleared Areas at Cerén, El Salvador*

The archaeological site of Cerén has provided researchers the opportunity to not only study structures and artifacts, but to examine the ways in which multiple spaces were utilized in the past. Recent research at Cerén has revealed three distinct types of cleared areas that had not been cultivated immediately prior to the Loma Caldera eruption. The first is a deliberately leveled, flat surface area; the second, an area that was cleared but retained its natural topography; and the third, abandoned manioc planting beds. Many of these cleared areas are located near agricultural fields that were either abandoned just prior to or were actively cultivated at the time of the Loma Caldera eruption. One interpretation of these areas is as agricultural processing spaces that were possibly fallowed or no longer used when the nearby fields were not in production. The abandoned manioc beds suggest that it was not necessary to maximize food production by cultivating all available space, and therefore agriculturalists were able to consciously decide where and when to cultivate. To advance our understanding of additional cleared spaces, further research utilizing GIS data is examining concentrations of artifacts within the Cerén site center.

Halperin, Christina (Princeton University)

[59] *Textile Techné: Regionalism and Shared*

Techniques in Classic Maya Cloth Production

Contemporary Maya textile techniques and aesthetics are highly regionalized with clear delineations formed around villages and towns. Likewise, Classic period Maya political formations were highly regionalized with multiple, shifting centers of gravity. Nonetheless, we know relatively little about the variability of Classic period textiles across the Maya Lowlands. This paper assesses the regionalism of Classic period textiles by examining textile tools and imagery from several polities across the Maya area. It considers, in particular, how gendered aspects of production, textile exchange, and the intimate relationships between different craft traditions informed a techné of ancient Maya textiles that did more to cross-cut polities than define them.

Hamilton, M. Colleen and Kholood Abdo Hintzman

- [102] *Mission San Gabriel Ceramics: Distribution and Frequencies of Occurrence of Exports and Indigenous Ceramics*

Ceramics as artifacts are considered an important tool in the understanding of Spanish Colonial development in California, including exploring the dynamics of market economy, world distribution, consumer behavior and interaction between Europeans and Native Americans. The 2011-2012 data recovery at Mission San Gabriel yielded a large assemblage of ceramics including Spanish, Mexican and British earthenware and Chinese porcelain in addition to local Native American Brownware. The analysis of Mission San Gabriel ceramic sherds explores contemporary worldwide distribution of certain ceramic products and vessel forms during the mission period. This paper investigates the frequencies of occurrence of different ceramic types, and similarities in exports and local ceramics alongat California missions along the west coast. It explores the industry and exchange of ceramics among indigenous people and European entrepreneurs as a mechanism of acculturation.

Hamilton, Phillip (University of Montana), Kristen Barnett (University of Montana), Alexandra Williams (University of Montana) and Anna Prentiss (University of Montana)

- [120] *Knapping on the Roof: Spatial Analysis of Materials from the Housepit 54 Final Roof, Bridge River Site, British Columbia*

Excavations of Housepit 54 at the Bridge River site in British Columbia focused in 2012 on the final occupation roof and floor dated to the Colonial period. An important component of the research process focuses on the nature of household architecture and variability in the formation of roof-associated assemblages of artifacts and faunal remains. This study provides geoarchaeological data on roof sediments and stratigraphy with the goal of identifying household entrances and roof architecture. It then uses a GIS framework to analyze spatial variation in cultural materials in order to test hypotheses about refuse discard and roof-top activity areas. Conclusions emphasize the organization of life in this prominent household within the Bridge River village.

Hamilton, Julie [194] see Schulting, Rick

Hamilton, Marcus (Santa Fe Institute) and Briggs Buchanan (Simon Fraser University)

- [291] *Tracking Late Pleistocene Human Expansions across Northeast Asia and into the Americas Using the Radiocarbon Record*

The overwhelming abundance of archaeological, genetic, and linguistic evidence indicates that the Americas were colonized by populations from Northeast Asia sometime during the late Pleistocene, most probably sometime after the last glacial maximum. However, the number of colonization events, their timing, and the routes taken are still highly contentious issues. In this presentation we use the late Pleistocene radiocarbon record of northeast Asia and North America to track the empirical expansion of modern humans across this vast region. We show

that regardless of any theory, the empirical radiocarbon record of the region is remarkably detailed and documents this biogeographic expansion to the extent that we can measure both the dynamics of these population expansions, and the likely timing of sequential colonization events from Siberia, into Beringia, and ultimately into the Americas. We show that the radiocarbon record clearly tracks the front of this population expansion across this region, and given the available data it is very unlikely that the Americas were colonized much before the Clovis time period, ~13-14k BP. In other words, claims of a deeper pre-Clovis colonization of the Americas would require a drastic re-dating of the entire Northeast Asian Upper Paleolithic.

Hammer, Emily (New York University)

- [225] *Spatial Boundaries between Premodern Nomads and Farmers in Southeastern Turkey*

In the Near East, spatial boundaries between pastoral nomadic and sedentary agricultural groups in the past have frequently been assumed by analogy to the locations of modern groups and on the basis of environmental conditions. This paper examines the possibilities and problems of archaeological attempts to empirically define the permeable spatial boundaries between nomads and farmers in critical periods of their history. The paper also challenges the common understanding that "enclosed" pastoral nomadic groups in the Near East were constrained to pasture zones that were largely determined by more powerful agricultural societies. Archaeological survey in southeastern Turkey has shown that pastoral nomads of the last 500 years, despite being circumscribed regionally by agricultural groups, retained control of their local territories. Several types of features documented in the areas around archaeological campsites—cisterns, cairns, and linear stone alignments in particular—could have served functional purposes while at the same time marking seasonal territorial boundaries.

Hammerstedt, Scott [34] see Lockhart, Jami

Hammond, Krystal (University of Nevada, Las Vegas) and Jennifer Thompson (University of Nevada, Las Vegas)

- [190] *Grave Reflections: Changes in Children's Burials at Non Nok Tha, Thailand (ca. 300-200 B.C.)*

Because individuals are not in control of the objects with which they are interred, grave offerings are not merely expressions of the identity of the decedent, but also the perceptions of that individual by those responsible for interment. Thus, while a child may not have used many ceramic vessels in life, upon death ceramics may be interred as an expression of the funeral orchestrators' understanding of that child. Differences in types and amounts of grave offerings may also reflect notions of status. This paper will discuss the differential allocation of grave offerings among children's burials from the 1968 skeletal series from Non Nok Tha, Thailand. Data shows that younger children were frequently buried with strings of shell beads while older individuals, on the cusp of adulthood, were interred with an abundance of ceramic offerings. Additionally, as the economy shifts from a mixed subsistence base to one more reliant upon rice cultivation, the types of grave offerings in children's burials change. Results of this research indicate that societal conceptions of children may have changed not only as they aged, but over time, thus adding to our understanding of prehistoric attitudes and perceptions of children.

Hampson, Jamie (University of Cambridge)

- [51] *Historiography and Rock Art in West Texas and Beyond*

Histories of North American archaeology often suggest that, until recently, empirical and theoretical studies of rock art were non-existent. As early as the nineteenth century, however, rock art researchers were in fact pioneers in the burgeoning fields of archaeology and anthropology. In this paper, I do not suggest that there was (or still is) a tidy, single factor that unites rock art

researchers. By outlining the aims and successes of some of the early North American studies, however, I demonstrate that rock art researchers helped shape the discipline of archaeology. I situate the few studies that focus on the rock art of west Texas within the broader, continent-wide historiography, and use multicultural Meyers Springs – one of only a handful of well-documented rock art sites west of the Lower Pecos River – as a case study.

Hancock, Y. [172] see Radini, Anita

Hansen, Anna and Henrik Zipsane

[72] *The Elderly as a Developing Market for Cultural Heritage Sites*

Is it ethically acceptable for the heritage sector to see the growing population of senior citizens as a developing market? Jamtli is an open air museum in the north of Sweden. The main target group is families with children, but there is an increasing amount of activities for elderly visitors being offered. The growing population of elderly people is a potential audience to Jamtli's commercial part as being a tourist attraction, if the right activities are offered. At the same time Jamtli has an important part to play in providing learning activities and working for social inclusion for various audiences. This paper takes its starting point by acknowledging that elderly people are not a homogenous group. Some are more active than others, and the willingness to get involved varies. Some want entertainment, others crave learning, while social inclusion and access are important to others. Using four examples, this paper explores a potential ethical dilemma of Jamtli being both a money-making tourist attraction and at the same time working towards learning and inclusion.

Hansen, Heather and Patrick McCutcheon (Central Washington University)

[148] *Evaluating Lithic Technology and Function Over the Last 5,000 Years at the Sunrise Ridge Borrow Pit Site, Mount Rainier, Washington*

Recent human land use models proposed for the Pacific Northwest are firmly embedded in a forager/collector framework that explains the shift in the organization of technology as a function of human efforts to store resources. Evidence of this shift in upland contexts of the Washington Cascade Mountains may only be subtle, as environmental constraints there are extreme and may select for a limited tool kit regardless of lowland changes in technology. To investigate changes, if any, over the last 5,000 years we employed a paradigmatic lithic classification to test the hypothesis that there is no major change in lithic technology and function. Preliminary results suggest that changes in lithic technology and function are not subtle during the last 5,000 years. Site components dating to the last 2,000 years have a more diverse lithic assemblage than earlier components. The change in diversity is evaluated in terms of tool stone sources, intra-site structure and sample size constraints. These results suggest that there may have been significant differences brought on by changes in the resource structure in upland contexts, as well as restrictions to exotic tool stone sources.

Hanson, Diane (University of Alaska Anchorage)

[130] *Archaeological Survey Bias in Island Environments: Finding Four Needles in a Haystack*

After excavating a 3400 rcybp upland house on Adak Island, in the Aleutian Archipelago of Alaska, our attention turned to locating a coastal house feature the same age with which to compare it. Archaeological research in the region has traditionally focused on coastal sites, yet there are only two houses (Russian period and late pre-contact) excavated in the central islands. The reasonable criticism about our search was that it would be like finding a needle in a haystack. Veltre (2012) also noted that sites older than 2500 years are rare in the Central Aleutian Islands. Using data

about terrace dates for north Adak, we limited tests to terraces 10-13 meters above sea level. Radiocarbon dates from four coastal sites (half the sites tested) ranged from 3280 to 3510 rcybp. These features were near enough in age to the upland house and within the time range of similar houses in the eastern Aleutian Islands (2450 to 3470 rcybp; Rogers 2011) to warrant consideration. The dates demonstrated that the pattern of recent dates in the Central Aleutian Islands may be associated with the tendency to place test pits in the highly visible late sites near the modern shoreline.

Hard, Robert [41] see Mauldin, Raymond

Hard, Robert (University of Texas at San Antonio), M. Kathryn Brown (University of Texas at San Antonio), Sonia Alconini (University of Texas at San Antonio) and Laura J. Levi (University of Texas at San Antonio)

[48] *Quantitative Learning in Introduction to Archaeology*

The University of Texas at San Antonio (UTSA) has recently embarked on a university-wide program to enhance quantitative learning across the undergraduate core curriculum. As part of this effort we have developed exercises for the Introduction to Archaeology course that give students the opportunity develop their ability to understand and synthesize archaeological data, produce, and interpret graphs, and synthesize their findings in reports. The principle exercise involves the analysis and interpretation of simulated mortuary data regarding status, economy, gender roles, and diachronic change. Exercises emphasize the use of scatter plots, histograms, and bar charts. Specific learning outcomes are tied to particular elements of the exercises. The UTSA Quantitative Learning Program staff has played a key role in providing guidance during the development of the exercises and learning outcomes. Pre- and post-tests are used to evaluate the effectiveness of this effort. Our experience and findings thus far are instructive as to how Introduction to Archaeology can contribute to university-wide efforts to enhance quantitative learning.

Harder, Rita [265] see Sutton, Paula

Harding, Alyson [2] see Poteate, Aaron

Harding, Victoria

[187] *Applications of ArcGIS at the Ripley Site*

This poster presents work conducted for a Master's thesis at Indiana University of Pennsylvania in the Applied Archaeology program and Geographic Information Systems Certificate program. ArcGIS will employ data from the Ripley Site (NYSM 2490) located in Chautauqua County, New York, in order to gain a better understanding of site use and type. The Ripley Site is a Woodland and Historic Contact Period Native American site. The focus of this project will be an ArcGIS analysis of spatial data from several phases of past excavations by archaeologists throughout the second half of the 1900s. Through ArcGIS and a variety of statistical analysis methods, a series of maps will be produced to answer specific research questions about intra-site structure. The Ripley Site was chosen to demonstrate the benefits of using ArcGIS to analyze spatial data because it is a well documented and studied site in which the question of site type is still an issue. In a broader context, this poster will present the significance of using new technology on older data.

[187] *Chair*

Hardy, Evan (Simon Fraser University), Grace Hua Zhang (Simon Fraser University, Burnaby, BC, Canada), Cindy Xin Zhao (Institute of Archaeology, Chinese Academy of Social Sciences), Deborah Merrett (Simon Fraser University,

Burnaby, BC, Canada) and Dongya Yang (Simon Fraser University, Burnaby, BC, Canada)

[38] *Temporal and Spatial Trends in Stature in Neolithic through Early Imperial Dynasties of China*

This study utilizes regression stature estimation formulae to examine regional variation in stature in Neolithic China and long-term changes in stature between the early Neolithic period and Jin dynasty (220CE – 420CE) in China. We collected data of mean statures and stature estimates from raw femur length data from published sources, consisting of 39 sites with MNI of 789 individuals (Male n=451, Female n=338). Although no significant regional pattern of stature variation could be defined from the collected data, it is clear that stature for both sexes declined following the Neolithic period interrupted only by a brief increase in male height during the Han dynasty (202BCE – 220CE). This overall secular trend seems to be consistent with declining health associated with increasing social complexity and population density. The anomalous increase in stature during the Han dynasty may be a consequence of this brief period's relatively more stable political climate resulting from a newly unified China.

Hardy, Maurice [96] see Blackwell, Bonnie A.B.

Hardy, Andrew

[108] *Multiple Functions of Precolumbian Buildings in the Andes: A Ceramic Analysis of Pyramid 3 in Panquima, Peru*

There is a discussion about the multiple functions that public buildings in the Andes had during precolumbian times. Some of these buildings were exclusively dedicated to religious functions while others residential palaces of the ruling elites. This paper will address this problem based on the analysis of the residential and public areas of Pyramid 3 at the Ychsma site of Panquima in the coast of Peru. Based on the analysis of the ceramic remains excavated in one of the dwellings and one of the platforms of Pyramid 3 I will examine the different type of activities that took place at each of these areas of the building.

Hardy, Karen (ICREA at Universitat Autònoma de Barcelona), Stephen Buckley (University of York, UK), Matthew Collins (University of York, UK), Anita Radini (University of York, UK) and Yvette Hancock (University of York, UK)

[172] *Not Only Starches: A Multidisciplinary Approach to the Study of Neanderthal Dental Calculus*

Dental calculus, a mineralized biofilm formed on teeth, is a very common 'deposit' found on archaeological skeletons. Trapping micro-debris from food and environment in its matrix while forming, dental calculus can preserve evidence of dietary and non-dietary activities. By combining several different methods of analysis, we aim to maximize the information we can retrieve. We present the results of a multidisciplinary analysis consisting of different types of microscopy together with thermal desorption-gas chromatography-mass spectrometry (TD-GC-MS) and pyrolysis-gas chromatography- mass spectrometry (Py-GC-MS). Our research demonstrates how a multidisciplinary approach can provide new insights, not only into the diet, but also living conditions, craft skills and environmental awareness.

Hare, P Gregory [92] see Mooney, Susan Moorhead

Hargrave, Michael (ERDC CERL), R. Berle Clay (Cultural Resource Analysts, Inc.), Rinita Dalan (Minnesota State University Moorhead), Diana Greenlee (University of Louisiana at Monroe) and Lewis Somers (Geoscan Research USA)

[34] *Geophysical and Archaeological Investigations at Poverty Point*

Ongoing investigations at Poverty Point are the result of

collaborative research by veteran instructors with the National Park Service's annual course in remote sensing. Geophysical and geoarchaeological methods being used include magnetic gradiometry, cart-mounted electrical resistance, magnetic susceptibility including down-hole and hand-held sensors, soil-coring, aerial LiDAR, and topographic mapping using an ATV-mounted GPS. Nearly all of the plaza and large portions of the ridges totaling 26 hectares have been surveyed using magnetic gradiometry. Selected portions of the ridges that include the north, northwest, west, and south aisles spanning 4.75 ha have been covered using electrical resistance. One of the most surprising discoveries - the presence of some 30 post circles ranging up to 60 meters in diameter - was verified by small-scale excavations. Radiocarbon assays suggest the circles date to ca. 1440-1120 B.C., within the interval when the ridges were constructed and used.

Hargrave, Michael [183] see Baxter, Carey

Harkey, Anna (University of California - Berkeley)

[285] *The Andean Home in a Shifting World*

The people of the Upper Mantaro Valley in central Peru saw rapid and dramatic change to their world, not once but many times between the Middle Horizon and Early Colonial periods. The move of whole villages from the valley floors, to dense and fortified hilltop settlements, was followed only a few centuries later by the arrival of the Inka, the forced abandonment of whole towns and the building of a provincial Inka capital. Little more than a generation later, the region was colonized again, this time by the Spanish, and was site of the first Spanish capital of Peru. Such enormous shifts, with empire on top of empire, are perhaps most easily studied at the largest scales, but their impacts must have reached even the smallest details of people's day-to-day lives. This project uses attribute-based analyses of both ceramics and standing domestic architecture – objects made and used locally, and intimately linked to all aspects of daily life – to gain insight into these small scale impacts of large scale political change, and the choices people made within their own households as the world around them spiraled ever outward.

Harkness, Rebecca (Arizona State University) and Will G. Russell

[89] *Quantity or Quality? Social Relations and Site Persistence in the Postclassic Mimbres Region*

Risk in small-scale, agrarian societies can be mitigated through the maintenance of diverse social connections. Thus, communities having broad social portfolios are more likely to be resilient under changing circumstances. To assess this hypothesis, we have examined artifact assemblages at the Postclassic Mimbres sites of Roadmap Village and Phyllis Pueblo. Despite proximity and rough contemporaneity, these sites exhibit marked diversity, including differing settlement histories. Using intrusive pottery as indicia of non-local relationships, we examine the intersection of social landscape and site-developing processes.

Harle, Michaelyn (Tennessee Valley Authority), Erin Pritchard (Tennessee Valley Authority) and Edward Wells (Tennessee Valley Authority)

[276] *River Operations and Its Effects on Archaeological Resources in the Tennessee River Valley*

The Tennessee Valley Authority (TVA) is responsible for overseeing approximately 293,000 acres of reservoir properties and an estimated 10,000 documented archaeological sites. TVA archaeologists are faced with the difficulty of protecting cultural resources that are constantly under threat of erosion due to normal reservoir operation activities. This problem is exacerbated by extended periods of reservoir drawdowns from both environmental and operational reasons and a deeply embedded regional tradition of artifact collecting. In this paper, we address the difficulties of managing significant archaeological resources in

these conditions and TVA's ongoing efforts to protect these resources. Specifically, we address TVA's three-pronged approach that includes both permanent and temporary erosion control methods, a regionally focused public outreach program and monitoring where looting or extended drawdowns are the worst, and the creation of an ARPA investigator program.

Harosh, Ortal [247] see Grosman, Leore

Harper, Christopher (HRA Inc., Conservation Archaeology)

[44] *Historic Logging within the Desert National Wildlife Refuge, Nevada*

Located within the Desert National Wildlife Refuge is evidence of historic period timber harvesting and processing. Several narrow canyons within the Sheep Range contain small groves of Ponderosa pine with evidence of a series of lumber mills sporadically used from the late 1800s into the mid 1900s. During the summer of 2011, HRA recorded the remains of two lumber mills, both which date from the 1920s into the 1940s. Evidence within this historic landscape suggests an extended but seasonal use of the area over time. Selective cutting and milling was practiced with no evidence of clear cutting or wide scale exploitation of the resource. Archival research suggests that the resulting lumber from the various sawmills in the area were used by Mormon settlers to construct communities within the Muddy and Virgin River Valleys from the 1860s into the 1940s.

Harper, Nathan [218] see Harry, Karen

Harris, Matthew (University of Queensland) and Patrick Faulkner (University of Queensland)

[68] *Tools or Tucker? Developing Methods for Identifying Utilized Polymesoda (Geloina) Coaxans Shell Valves*

In contrast to the robust analytical frameworks developed for stone tool identification, there is a paucity of research addressing the identification of expedient bivalve shell tools from archaeological contexts. The development of analytical frameworks to identify expedient shell tools would enhance archaeological understanding of coastal economies in Australia and abroad. A holistic method of analysis is implemented that considers processes of alteration affecting molluscan shell as a component of a living organism, and the shell as a tool. This method includes detailed consideration of pre- and post-mortem environmental, anthropogenic and taphonomic processes. Experimentally derived expedient shell tools, modern specimens of the estuarine bivalve Polymesoda (Geloina) coaxans (Gmelin, 1791), and archaeologically recovered samples were investigated to identify diagnostic differences between anthropogenically and naturally modified shells. By utilising multiple complementary analyses at different scales (macroscopic and microscopic), a robust framework for the identification of expedient bivalve tools was created. Results indicate that it is possible to differentiate between those shell valves which have been utilized by humans, and those which are naturally modified. A case-study of archaeological shell tools from Princess Charlotte Bay, Cape York, north east Queensland, Australia, has shown that these methods can be successfully applied to archaeological assemblages.

Harris, Jacob [117] see Otárola-Castillo, Erik

Harris, Lucille (University of Toronto)

[137] *Hierarchy as an Organizational Structure in the Complex Hunter-Gatherer Communities of the Mid-Fraser Region, South-Central British Columbia*

This paper explores the changing nature of social organization

associated with the growth and breakup of large nucleated hunter-gatherer winter settlements in the Mid-Fraser region of south-central British Columbia, ca. 2000-300 cal. B.P. These communities are frequently cited as textbook examples of socially stratified hunter-gatherers with wealth-based forms of social inequality. However, this study, which is based on the largest dataset yet compiled from the Mid-Fraser region, finds little evidence to support this interpretation and offers an alternative hierarchical framework for understanding social and political dynamics in these communities. It is argued that the formation and breakup of aggregated villages is indicative of a shifting balance of power between band political structures and extended family autonomy. In this interpretation, band political structures are argued to have predominated during the aggregated village period and operated to maintain relative equality between families by ensuring equal access to resources. The breakup of these communities is then indicative of the reassertion of extended family autonomy during a period of highly stressed resource conditions. It is during periods when extended families operate more independently of band political structures that the opportunity for unequal access to resources and wealth emerges.

Harris, Kathryn (Washington State University) and Stefani A. Crabtree (Washington State University)

[148] *Stop, Rock, and Drop: A Neutral Model of Lithic Stone Procurement in Southern Idaho*

Agent-based modeling is especially suited to questions archaeology seeks to answer. The people studied by archaeologists no longer exist, so we are tasked with piecing together prehistoric behavior with the material evidence left behind. One of the most common pieces of material evidence found across the world and through long spans of time are stone tools. Archaeologists have long been interested in answering the "who, what, when, where, and why" questions behind the procurement of stone tool raw materials. The purpose of this project was to create a null agent-based model by which assumptions of adaptation in lithic procurement may be tested. This model essentially reconstructed P. Jeffrey Brantingham's "Neutral Model of Stone Raw Material Procurement." However, the extension of this reconstructed model was applied to the GIS landscape of southern Idaho. Implementation of this model on a realistic landscape with a non-random distribution of raw material sources was important to test for results that differ from the original neutral model. Additionally, application to a real geographic area more readily facilitates comparison of simulation results to data from the archaeological record.

Harrison, Vivian (Yakama Nation)

[246] *Discussant*

Harrison-Buck, Eleanor (University of New Hampshire)

[14] *Exploring Epistemologies and Ontologies of Agency and Personhood: An Introduction*

The study of non-anthropocentric material agency considers the role(s) of nonhumans as social actors and offers an epistemic practice that allows for alternative ontologies to emerge in archaeology. Yet, by placing the focus on objects as subjects and narrowing the divide between humans and nonhumans, we also risk losing sight of the "more complicated world of relations"—all that stuff that goes on in the empty spaces within and between people and objects (Fowles 2010:25). Here we explore this "blind spot" in an effort to better understand the subject-object dialectic and some of the challenges that the study of human-object relationships present to archaeologists. We offer several examples where the numinous is the real subject and the object itself is simply a receptacle-body and point of interaction. The numen is fluid, lacks physicality, is unpredictable, and, by its very nature, surpasses comprehension. Moreover, in some instances such nonhuman agents are believed to be powerful and dangerous with or without the aid of humans.

[14]

Chair

Harrod, Ryan [101] see Osterholtz, Anna

Harrod, Ryan (UNLV) and Debra Martin (UNLV)

[219] *Climate and Conflict in the American Southwest: Bioarchaeological Analysis of the Relationship between Environmental Change and Interpersonal Conflict and Violence*

Beginning around the 19th century with Wetherill's discovery of lethal violence at Cave 7 and later Hough's discovery of cannibalism at Canyon Butte Ruin 3, (add comma here) many scholars have pondered the significance of violence in ancient Southwest communities. Of the countless articles, books, and news reports that have been written on this topic, almost all suggest a strong connection between violence and drought and other aspects of environmental instability. Do long periods of drought cause people to become more violent? This project uses a bioarchaeological approach that considers demography, nutrition, trauma, and pathology data collected from the human remains. These data were combined with the extensive climate data and archaeological reconstruction of these burial sites. Our results suggest that shifts in climatic conditions alone cannot explain episodes of violence nor periods of relative peacefulness. The data indicate that conflict is affected by the complex interaction of several factors including environmental instability but combined with migration, ideology, alliances, and trade patterns. In our studies, violence is more statistically correlated with migration and population movement. An alternative interpretation of the reasons for violence includes the fear of resource unpredictability that compels people to migrate.

[286] *Chair*

Harry, Karen (University of Nevada-Las Vegas)

[218] *Shaping Cultural Identity on the Western Frontier of the Puebloan World*

Archaic period inhabitants of southeastern Nevada were generalized foragers whose material culture largely mirrored that of their Great Basin contemporaries. This situation changed following the adoption of agriculture in that area. Specifically, in addition to cultivated crops, the period between A.D. 200 and 500 witnessed the adoption of puebloan style ceramics and architecture, leading many researchers to hypothesize an influx of Basketmaker immigrants. However, a regional comparison of non-metric dental traits with Virgin Branch Puebloan skeletal samples does not support this view. Instead, it suggests that these farmers descended from a different ancestral population than other puebloan groups; one that maintained a greater phenotypic affinity to Great Basin populations. Despite these ancestral differences, from between about A.D. 500 and 1200 the farmers of southeastern Nevada were unequivocally part of the puebloan world, as reflected in their architectural forms, ceramic motifs, and other aspects of material culture. At the same time, they maintained important cultural differences, including those associated with religious practices. In this paper, we examine how and why the prehistoric inhabitants of this frontier area adopted selected aspects of puebloan culture, and the implications that this selection process had on their cultural identities.

[218] *Chair*

Harry, Karen [258] see Frink, Liam

Hart, David [125] see Kaufmann, Kira

Hassan, Diane [277] see Weinstein, Laurie

Hastorf, Christine [74] see Miller, Melanie

Haug, Robert (University of Cincinnati)

[239] *Recycled Elites: The Transformation of the Dihqāns in Early Islamic Khurāsān*

The dihqāns (Persian petty landed gentry) held important positions of economic and political power in the late Sasanian Empire, most notably as tax collectors and military recruiters. With the rise of Islam in the seventh century and the subsequent collapse of the Sasanian Empire, the dihqāns found themselves and their positions of authority challenged, but the realities of the early Caliphate (especially the numerical minority status of the Arab-Muslim ruling elite and its reliance on local elites to effectively administer the empire) created a space for the dihqāns to transform themselves into a new Persian-Muslim elite.

This paper focuses on the dihqāns of Khurāsān (northeastern Iran, western and northern Afghanistan, and Turkmenistan) during the early Islamic period and their transformation from pre-Islamic, Persian elites into the provincial dynasties that ruled Islamic Iran and Central Asia in the ninth and tenth centuries. By following the transformation of the dihqāns over the seventh through ninth centuries using both textual records and material culture (including architecture, pottery, and numismatics), we may see the dihqāns struggle not only to preserve their positions of authority, but redefine the basis for their authority in the new language of the Islamic Caliphate.

Hauser, Neil [33] see Landt, Matthew

Hauser, Neil (ATSA), James Feathers (University of Washington) and David Sanderson (Scottish Universities Environmental Research Center)

[147] *Dating Exposed Surfaces Using Penetration of OSL Bleaching*

Reduction of latent luminescence by exposure to sunlight, optical bleaching is the basis for sediment dating. This work explores whether the depth of bleaching into a translucent silicate rock can be used to determine how long the surface of a quarry or other rock surface has been exposed to sunlight. Four cores of lithic material from the same source were exposed to natural sunlight for over a year and an additional one was exposed to the same environmental conditions but not sunlight for the same period, to provide a control. Two of the exposed cores and the control were examined at Scottish Universities Environmental Research Centre (SUERC) in Glasgow, Scotland. Using an experimental instrument, the cores were scanned in two dimensions to obtain a mapping of the luminescence. The remaining two cores exposed to sunlight were sliced into twelve and sixteen 400-micron thick disks, respectively, and the luminescence measured using a standard SAR protocol at the OSL Laboratory at the University of Washington, Seattle.

Hawkins, Stuart [138] see Kinaston, Rebecca

Hayashi, Kazuhiro, Masami Izuho (Tokyo Metropolitan University), Ian Buvit (Central Washington University), Karisa Terry (Central Washington University) and Tsubasa Kamei (Hirosaki University)

[233] *Fabric Analysis of Lithic Artifacts at the Shimaki Site, Hokkaido, Japan*

Clast fabric analysis, also referred to as trend and plunge or strike and dip, for archaeological assemblages is often used to distinguish natural processes and to assess site formation processes. This report reviews fabric analysis conducted at the Shimaki site, a middle Upper Paleolithic site in Hokkaido, Japan. The data on orientation and dip of the long axis (A-axis) and the AB plane of lithic specimens was recorded. Statistical spatial analysis is used to distinguish whether fabric patterning occurs in specific locations within the site. Artifact distributions in the block excavation can be divided into two horizontal clusters by k-means

cluster analysis, and in four vertical levels by principal component analysis. The lowest level shows random orientation distributions and also planar character, while upper levels show preferred orientation in specific directions. This pattern suggests rearrangement of the upper levels of lithic artifacts and suggests some kind of deformation. The result of this report can be used for further examination of synthetic site formation processes at the Shimaki site, especially for explanations of post-depositional processes.

Hayashida, Frances M. [183] see Wagner, Ursel

Hayden, Brian [128] see Villeneuve, Suzanne

Hayden, Brian (Simon Fraser University) and Suzanne Villeneuve (Simon Fraser University)

[241] *The Power of Secret Societies in the Past*

In theoretical and practical archaeological discourses the role or even the existence of secret societies has been almost completely neglected. We argue that secret societies have been one of the most common staging platforms for ritual and religious developments in transegalitarian societies of the past, and that they were major factors in the development of sociopolitical complexity of early, as well as many ethnographic, cultures. Moreover, their activities have generated distinctive material indicators including the use of caves for rituals, the construction of semi-subterranean structures, cult objects, special burials, the hosting of public and private feasts, anthropophagy, and iconographies of power animals.

[258] *Discussant*

[241] *Chair*

Hayes, Elspeth [150] see Marwick, Ben

Haynes, Gary [248] see Wriston, Teresa

Hays, Maureen [119] see Falls, Eva

Hays-Gilpin, Kelley (Northern Arizona Univ) and Dennis Gilpin

[67] *Becoming Hopi: Exploring Hopi Ethnogenesis through Architecture, Pottery, and Cultural Knowledge*

We have worked with Leigh Kuwanwisiwma and other Hopi cultural experts for nearly 20 years, from cultural resource management projects to museum exhibits to repatriation. The collaborative relationships we have developed have transformed our archaeological practice and understandings of the past. We find common ground in studying the distributions of pottery and architectural features in the light of traditional Hopi knowledge and clan stories. In this presentation, we focus on three large pueblos excavated in the late 19th and early 20th centuries: Sikyatki, Awat'ovi, and Kawayka'a. Taken together, archaeological evidence, traditional knowledge, and clan stories reveal diverse and far-flung geographic and cultural origins of Hopi ancestors.

Hayward, Michele (Panamerican Consultants), Frank Schieppati (Panamerican Consultants) and Michael Cinquino (Panamerican Consultants)

[18] *Rock Art and Ball Courts: Caribbean Style*

Ball courts and plazas are found throughout the Greater Antilles with concentrations on certain islands including Puerto Rico and Hispaniola. Research on these rock and earthen-lined level structures has been descriptive, as well as theoretical: integrating such characteristics as size, location and number into political,

social and religious developmental frameworks. Although a significant percentage of ball courts possess rock art, their carved images have infrequently been addressed in these discussions. We argue that the addition of rock art adds depth, complexity and new facets to prehistoric Caribbean cultural models.

Hayward, Anne (Pennsylvania State University)

[234] *Tribute Textiles and Regional Clothing Styles*

During the Late Postclassic Period (1200-1521 CE) in Mesoamerica, textiles were used by all members of society and held economic and social importance. Cloth served as trade goods, tribute items, gifts, and currency. Clothing material, style, and decoration often indicated a person's social status or hometown. The manufacture of fabric was a daily activity for the majority of women across the Aztec Empire. This study considers a crucial, yet understudied part of Mesoamerica's material culture. I survey the variety of depictions and descriptions that appear in tribute lists and codices. My poster compares these illustrations to the traditional clothing styles of extant groups in Mesoamerica. This work will contribute to the understanding of ancient Mesoamerican economics and the retention of group identity through time.

Hazard, Rebecca [47] see Dudgeon, John

He, Yuling [38] see Zhang, Hua

Heckbert, Scott (Alberta Innovates)

[23] *Growing the Ancient Maya Social-Ecological System from the Bottom Up*

Archaeological evidence can be represented in quantitative models and used to test theories of societal growth, development, and resilience. This paper describes the results of simulations employing agent-based, cellular automata, and network models to represent elements of the ancient Maya social-ecological system. The purpose of the model is to better understand the complex dynamics of the Maya civilization and to test quantitative indicators of resilience as predictors of system sustainability or decline. We also discuss how similar indicators might be useful in today's world. The value of developing simulation models lies in the ability to explicitly define assumptions and test their effect on the system, observed through changes in variables over time and compared across scenarios. The model presented examines the relationship between population growth, agricultural production, pressure on ecosystem services, forest succession, value of trade, and the stability of trade networks. These combine to allow agents representing Maya settlements to develop and expand within a landscape that changes under climate variation and responds to anthropogenic pressure. The model is able to reproduce spatial patterns and timelines somewhat analogous to that of the ancient Maya, although this proof of concept stage model requires refinement and further archaeological data for calibration.

Heckenberger, Michael [15] see Neves, Eduardo

Hedden, John (The University of Iowa)

[124] *Central Plains Tradition Smoking Pipes in the Glenwood Locality of Iowa: Within a Landscape of the Rising and Falling Sky*

Central Plains Tradition sites are present in western Iowa only within a small area in the Loess Hills, immediately east of the Missouri River. The distinctive topography of this region, consisting of an intricately carved terrain of windblown silt, is unique and rare among the world's landscapes. The recovery of large numbers of effigy pipe forms in this locality indicates that shamanistic practices were conducted. Decorative

motifs on small numbers of the recovered pipe assemblage suggest specific ritual processes may have been performed within individual lodges.

Hedgepeth, Jessica (University of Colorado, Boulder), Arthur Joyce (University of Colorado, Boulder), Michelle Goman (Sonoma State University) and William Middleton (Rochester Institute of Technology)

[264] *A GIS Study of Formative Period Landscape and Settlement Change in the Lower Río Verde Valley, Oaxaca, Mexico*

Interdisciplinary research on the historical ecology of the lower Río Verde Valley indicates that major social and environmental changes occurred during the Formative period (1800 B.C.-A.D. 250). During the Early/Middle Formative (1800-400 B.C.), the Río Verde's floodplain expanded and resource-rich estuaries formed. Population growth and settlement aggregation began by the Middle Formative, reaching unprecedented levels in the Terminal Formative (150 B.C.-A.D. 250) when a powerful, urban polity developed at Río Viejo. Lower Verde researchers have hypothesized that population growth, agricultural intensification, and landscape changes were linked. This paper discusses recent GIS analyses conducted to test this hypothesis. Our study examines the geospatial relationship of Formative period settlement to biophysical features such as soils, vegetation, water features, and topography. We consider whether agricultural productivity in the lower Verde can be measured in a manner similar to Kirkby's Valley of Oaxaca study (1973). Evidence suggests that the relationship between landscape change and sociopolitical developments is not one of simple cause and effect. Historical memory of landscape must also be taken into account.

Hedman, William [184] see White, Paul

Hedquist, Saul [43] see Fladd, Samantha

Hedquist, Saul (University of Arizona) and Alyson Thibodeau (University of Arizona)

[252] *Sacred Turquoise: Blue-Green Stone in the Late Prehispanic Pueblo World*

Throughout the prehispanic Pueblo world, turquoise was undoubtedly among the most coveted of items—widely distributed, though often following singularized pathways and depositional processes. Archaeological and ethnohistorical accounts note turquoise ornaments cached within the foundations and important features of homes and kivas, presented as offerings within shrines, ritually deposited within decommissioned structures, and placed within high-status burials. In this paper we examine the circulation and consumption of cultural turquoise (including other blue-green stone) within and among Western Pueblo settlements of the early and middle Pueblo IV period (A.D. 1275-1400), a dynamic age of population movement, aggregation, and pan-regional ideological change. We explore regional patterns of deposition, technological and stylistic variation, and common associations between cultural turquoise and other material things. Additionally, we summarize ongoing geochemical (isotopic) investigations of mineral turquoise provenance, where preliminary observations indicate turquoise from at least two geologic locales—the Cerrillos Hills (New Mexico) and Canyon Creek (Arizona)—circulated throughout the Western Pueblo world during the Pueblo IV period.

Hefner, Joseph [190] see Christensen, Alexander

Hegmon, Michelle [89] see Torvinen, Andrea

Hegmon, Michelle (Arizona State University)

[273] *The Archaeology of the Human Experience:*

Goals and Potential

The Archaeology of Human Experience – its goals, challenges, methods, and future— are discussed to introduce the session. Focus on the human experience humanizes our view of the past, making archaeology more relevant for the general public, policy-makers, and sustainability issues. It enhances the explanatory potential of archaeology, providing insight into why some events or processes trigger major changes and others do not. It links practice theory with the development literature's concept of capabilities. The approach must beware of judging other times and places by present standards, a challenge that can be met through comparative analyses. Well-established archaeological techniques and analyses can be used to address new concepts such as quality of life, human securities, and vulnerabilities. This session focuses primarily on challenges, the darker side of the human experience, including food insecurity, inequities that affected life chances, and the treatment of captives. However, a broader perspective on the archaeology of the human experience, planned for the near future, will encompass the full range of experience including such issues as creativity and innovation. The approach has the potential to encompass and contribute to various theoretical perspectives within archaeology and beyond.

[273] *Chair*

Heidenreich, Stephan

[168] *Over the Pond, to the Lab, and Modeled into the Landscape: Lessons Learned from an Overseas Study of Beringian Museum Collections in Alaska*

In the course of a dissertation research project a number of lithic tool assemblages from different late Pleistocene sites in Alaska were studied. The aim of the project was to investigate functional variability of hunter-gatherer camp sites in Eastern Beringia and to reconstruct a model of late Pleistocene land use. In addition to the major results of the dissertation, this paper will present the procedures and challenges of a young researcher from Europe working with museum collections from the other side of the globe. This presentation also demonstrates the utility of curated collections for new research perspectives, and how "old" assemblages can be used to address "new" questions.

Heiko, Prümers [60] see Hermenegildo, Tiago

Hein, Anke (UCLA)

[216] *The Special Case of Yanyuan: Steppe Influences, Southern Contacts, and Local Particularities as Reflected in a Bronze Assemblage from Southwest Sichuan*

Being a high-altitude plateau surrounded by towering mountains of the Henglanshan, the Yanyuan Depression in Southwest Sichuan is rather remote and not easily accessible even with modern-day transportation. Nevertheless, since the 1980s peasant finds, followed up by excavations have revealed astonishing numbers of highly decorated bronze weapons, as well as personal ornaments, drums, bells, and intricate objects of unclear function depicting birds and wild beasts as well as humans, all executed in high-quality craftsmanship. Many of these objects exhibit strong resemblances not only with neighboring regions of Yunnan, and areas further north such as northern Sichuan, but also places as far away as the Ordos Region, Central Asia, and possibly even the Near East. This paper aims at exploring the multiple avenues of possible influences and contacts reflected in the material record of Yanyuan, highlighting not only directions and routes of cultural exchange but also local idiosyncrasies and geographic preconditions that shaped the unique archaeological assemblage of the area.

[249] *Discussant*

[216]

Chair

Hein, Anno [288] see Day, Peter

Heindel, Theresa (University of Colorado) and Céline Lamb (Université Paris 1 Panthéon-Sorbonne)

[210] *Heterogeneity in Maize Fields: New Evidence from the 2011 Cerén Field Season*
 Excavations conducted during the 2011 field season south of the Cerén site in El Salvador revealed unexpected heterogeneity in maize field construction and maintenance. Given the difficulties of studying agricultural production in the archaeological record, researchers have assumed relatively homogenous cultivation of maize and been unable to examine the diversity of farming techniques possibly employed in maize production. In the 2011 Cerén excavations, the presence of landuse lines, stylistic differences, and variation in field orientation suggests the existence of individual farmer's fields. Diversity is especially apparent in the levels of effort and general growing styles, as evidenced in portions of seven separate maize fields excavated in the 2011 field season. Different levels of investment were observed in field preparation and maintenance, when the maize was planted, and in crop productivity. Productivity differences were also evident in a higher number of ears per stalk in the more well kept fields. Based on this new evidence, it can be argued that not all maize fields were created equally, and individual farmers were able to make their own decisions regarding field planting and maintenance.

Heindl, Alex [122] see Wedding, Jeffrey

Heitert , Kristen [119] see Gillis, Nichole

Heller, Abby [37] see Stone, Jessica

Henderson, John [171] see Joyce, Rosemary

Hendon, Julia (Gettysburg College)

[14] *Crafting Persons in Mesoamerica: Technological Processes and Relational Identities*

When craft producers engage in their craft, what are they doing? This question could be answered in terms of human action and agency (craft producers are people who make things) or in terms of relationships between humans (craft producers make things for other people). This paper explores an alternative ontology whereby craft production constructs personhood for both the craft producer and the thing produced through a relational and symmetrical process. The skills, knowledge, and techniques essential to a particular craft form an important part of this process as do the embodied interactions with the materials with which craft producers work. The paper focuses on a particular time and place, that of southeastern Mesoamerica in the eighth to eleventh centuries, in order to explore this approach in detail through a focus on the crafting of textiles and objects of clay. Mesoamerican personhood develops out of relationships that are connected to the passage of time and to locations within a socially defined landscape. These relational identities connect humans and non-humans, corporeal and noncorporeal entities, and animate and inanimate beings.

[171] *Discussant*

[14] *Chair*

Hendon, Julia [14] see Harrison-Buck, Eleanor

Hendrickson, Mitch (University of Illinois at Chicago)

[104] *Fusing Scissors, Paper, and Rock: An Archaeological Investigation of the Metallurgy, Text, and Masonry Histories at the Angkorian Khmer Complex of Preah Khan of Kompong Svay, Cambodia*

Preah Khan of Kompong Svay, situated 100 km east of Angkor in central Cambodia, is unique as it is both the largest Khmer center ever built and is the only urban complex with evidence of iron smelting inside its walls. Initial interpretations of Preah Khan suggested it was established to facilitate iron production during the rapid expansion of the Khmer across mainland Southeast Asia between the 11th to 13th centuries. Through combined evaluation of masonry, text and metallurgical evidence, this paper reveals an important historical disjunction that suggests iron smelting is instead associated with the decline of the Empire and potentially the fall of Angkor in 1431.

[104] *Chair*

Henebry-DeLeon, Lourdes

[246] *Discussant*

Heng, Piphil (University of Hawai'i at Manoa)

[104] *New Light on the Pre-Angkorian Polity: Viewed from a Regional Center of Thala Borivat*

Most knowledge of the pre-Angkorian settlement patterns is based on archaeological data from the Mekong Delta of southern Cambodia and Vietnam. This region is considered to contain evidence of the early state development of the pre-Angkorian period. Outside of the delta, however, the evidence is sparse due to limit research. At its peak epoch, the pre-Angkor polity had its base in central Cambodia and controlled over a large territory in northeast Thailand, southern Laos, Cambodia, and southern Vietnam. This paper presents recent evidence of the pre-Angkorian settlement patterns north of the delta based on field survey conducted in one of the pre-Angkorian regional centers, Thala Borivat. Although settlements of this area fall into linear and nucleated patterns or both, its proximity to large rivers is very distinct from settlements in the delta where proximity to smaller tributaries is preferable. The data infer a spatial relationship between habitations and religious monuments because areas with higher surface ceramic density are generally located closer to the religious monuments. Surface ceramics decrease with the distance away from the religious monuments. It is, thus, argued that the settlement systems of this area were based upon a form of temple economy illustrated in the pre-Angkorian inscriptions.

Heng, Piphil [104] see Stark, Miriam

Henkes, Gregory (Johns Hopkins University), Torben Rick (Smithsonian Institution National Museum of Natural) and Benjamin Passey (Johns Hopkins University)

[172] *Carbonate Clumped Isotope Thermometry of Archaeological Shell from the Chesapeake Bay*

Clumped isotope geochemistry examines the abundance and distribution of molecular bonds containing more than one rare isotope. A prominent application is carbonate clumped isotope thermometry, which is concerned with the temperature dependence of bond formation between ^{13}C and ^{18}O in carbonates. An advantage of this thermometer over the familiar oxygen isotope thermometer is that it is independent of the bulk isotope composition of the mineral. A combination of oxygen and clumped isotope thermometry can allow the determination of the temperature and oxygen isotope composition of the precipitating fluid. This approach is well-suited for biogenic carbonates from estuarine waters where temperatures and isotopic compositions

are variable. We present results from clumped isotope analyses of modern and archaeological shells from the Chesapeake Bay to evaluate the accuracy of temperature and δ₁₈O determinations of mesohaline waters, and to provide an environmental context for prehistoric human exploitation of the Eastern Oyster. The data indicate that average temperatures and isotopic compositions of oyster growth waters varied by 2-3 °C and 1-2‰, respectively, over the last ~1000 years. We discuss our results in the context of the Holocene paleoclimate of the Chesapeake Bay and highlight clumped isotope thermometry as a new tool in coastal archaeology.

Henry, Amanda (The Max Planck Institute for Evolutionary Anthropology)

[172] *Discussant*
[172] *Chair*

Henry, Amanda G. [172] see Salazar-García, Domingo Carlos

Henton , Liz [32] see Marciniak, Arkadiusz

Heppner, Annalisa (University of Alaska, Anchorage) and David Yesner (University of Alaska, Anchorage)

[88] *Osseous Tools from the Broken Mammoth Site (XBD-131)*

The Broken Mammoth Site (XBD-131) has a small number of osseous tools from Cultural Zones 3 and 4. This poster identifies these artifacts photographically, explains their excavation, provenience, post-field processing, and dating. It also includes a map of Eastern Beringian Sites that have produced other organic tools of Pleistocene/Holocene Transitional age. This is the first step in a Master's Thesis which will include a more comprehensive microscopic examination of the Broken Mammoth artifacts and an attempt to place the artifacts in a broader Beringian and Paleoindian Context.

Herbert, James (Stantec Consulting Ltd.) and Sean P. Connaughton (Stantec Consulting Ltd., Simon Fraser University)

[262] *First Steps in Developing Sustainable Partnerships*

Incorporating community involvement and collaboration in archaeological research is difficult in the best of situations. When attempting to apply these principles to Cultural Resource Management, with its multiple stakeholders, time and budget constraints, narrow work parameters, and other intricacies, it becomes much more challenging. Using examples taken from a year-long major excavation in British Columbia's Lower Mainland, we suggest methods and techniques for bridging the gap between the academic model of Community Based Participatory Research and the more practical considerations required of Consulting Archaeology. This paper offers a look at the first steps taken towards greater collaboration between developers, archaeologists and Indigenous communities. These examples represent the first small steps in moving towards a future where CRM helps facilitate the development of more sustainable partnerships.

Herckis, Lauren (University of Pittsburgh)

[262] *The Women Can Wash: Employing Women on an Archaeological Crew*

Archaeologists in northern Chiapas have employed local labor for decades. Generally lead archaeologists have been men, and labor at excavation sites has been exclusively male. Tone and rapport of these crews is shaped by an exclusively male and multilingual environment. Asserting authority and commanding the respect typically afforded a lead archaeologist poses a unique set of challenges for a woman and a foreigner. One approach to this challenge is to hire female workers. My labor comes primarily from a Ch'ol community in which paid work generally supplements

subsistence farming. The first women to join me were women on the margins, whose male relative(s) were present to chaperone. These were eventually joined by unmarried, unaccompanied, trendsetting young women from prominent families, and later by married women. The tenor and content of conversation amongst crew members changed dramatically with the inclusion of women and especially in the presence of young women from prominent families. By the end of a second field season, women on site were often addressed in ways typically reserved for men. In this paper, I explain how asserting authority as a lead archaeologist in this deeply gendered context was negotiated through the inclusion of female labor in unorthodox roles.

Heredia Espinoza, Verenice (El Colegio de Michoacan)

[133] *The Dynamics of the Corporate-Network Continuum in the Central Valleys of Jalisco during the Postclassic: Comparing Different Scales of Analysis*

The central valleys of Jalisco are known to have been home to a complex society that took an alternative pathway toward complexity, and most research has focused on the Late Formative and Classic for this reason. As this society declined at the end of the Middle Classic (ca. A.D. 500), dramatic changes took place that ushered in new cultural expressions in settlement patterns, architecture, artifacts, and interments that have also received much archaeological attention. In this paper, I focus on the Postclassic, an understudied period whose settlement pattern suggests major organizational differences from elsewhere in Postclassic Mesoamerica. Systematic archaeological research has failed to identify either large palaces or monumental civic-ceremonial architecture. Such a pattern suggests that traditional archaeological theories of complexity, which focus on elites and their aggrandizing personal power strategies, are inadequate to explain the sociocultural organization of Postclassic groups in this area. Here, I make an attempt to explain settlement patterns, intrasite spatial architectural arrangements, and the distribution of artifacts in light of corporate/collective strategies. This case will make an important contribution to archaeological theories of complex societies, as well as comparative cases of more corporate/collective societies.

[133] *Chair*

Heredia Espinoza, Verenice [231] see Blanton, Richard

Herlich, Jessica (College of William and Mary)

[81] *Shell Midden Archaeology and Paleoethnobotany: Historical Ecological Perspectives of the Tidewater Algonquian Landscape*

This paper presents paleoethnobotanical research at the intersection of Native social practices, foodways, and resource diversity in coastal Virginia. Intact stratified deposits from a Woodland-period shell midden provide a window into changes in human-environmental dynamics from A.D. 1 to 1600. In this paper I draw on paleoethnobotanical evidence, including macrobotanical material and phytoliths, to offer a deep history of landscape and related changes in coastal hunter-gatherer life ways. The evidence points toward use of diverse coastal resources and provides insight into seasonal occupations of the midden area. The landscape was impacted by growing populations, particularly during the Middle Woodland period, and was affected by subsistence changes that included the adoption of domesticates.

Hermann, Aymeric (University of French Polynesia)

[181] *Stone Tool Production Processes and Exchange in Central Polynesia: Geochemistry Applied to Archaeology*

Over the last century, Polynesian material culture studies consisted of the identification of the distinctive range of artifacts

coming from different islands and archipelagos. Because of their ubiquity, adzes were long used as a "cultural fossil" and along with inter-island typological comparisons of this material and radiocarbon data cultural sequences were defined. Thus, typological analyses of implements have been useful when assimilating the archaeological diversity in Oceania. Yet these studies clearly lack of efficiency when shedding light on the manufacturing process of artifacts. Within the technological approach, every sequence of action is to be considered, from raw material procurement to the discard of the used tool. Aspects of socio-political organization may likely be inferred by taking in consideration knowledge specialization, primary function of production and maintenance sites, and the spatial distribution of adzes. Along with the need to consider the whole manufacturing process and exchange networks goes the necessity to link different archaeological assemblages. Geochemical analysis of rock material used in tool manufacture is then carried out to settle the proper framework that would allow a technological investigation of ancient Polynesian society.

Hermenegildo, Tiago (T Hermenegildo), Prümers Heiko (Collaborator) and O'Connell Tamsin (Supervisor)
[60] *A Stable Isotope Approach to Prehistoric Resource Management and Dietary Patterns in the Amazon*

To this very day, when it comes to the South American lowlands the application of archaeological science techniques has been quite sparing. Publications of stable isotope analyses of archaeological material in the region are particularly rare and only a handful of articles have been published so far. This work is a result of a PhD project that focuses on developing the first exploratory, large scale comparative work using carbon and nitrogen stable isotope data drawn from bone collagen samples recovered from sites in the Amazon. Results will be presented from over 600 human and faunal samples from several geographical and chronological contexts, starting at the mouth of the Amazon River in Brazil and finishing in the Llanos the Moxos in Bolivia covering over 4000km. The aim is to construct a clearer picture of the broad scale dietary choices and patterns of the people that inhabited the pre historical Amazon. We then seek to identify and quantify evidences of resource management and/or domestication of both plant and animal resources since around 2000 B.P. and ask how relevant these processes were to the human groups in question.

Hernandez, Cristian [36] see Gongora, Angel

Hernandez, Hector (Universidad Autonoma de Yucatan)

[113] *Masculine Places at Chichén Itzá: Ritual Activity and Social Identity in a Terminal Classic Structure*

Excavation and archaeological analysis of a patio-gallery structure located at the east side of the main plaza of Chichén Itzá have provided evidence about men's ritual activities and social identities during Terminal Classic period (900-1100 AD). Masculinity and gender, as analytical categories, have promoted a reevaluation of the different roles and identities that male actors played in complex past societies. In structure 2D6 at Chichén Itzá, we found material evidence of a variety of activities ranging from the ritual performance through remains of ludic spaces within the structure that could be related with an ideology of prehispanic maya manhood. Thus, the purpose of this paper is to discuss the implications of the cultural construction of masculine gender, the presence of exclusive men places, and the practice of specific ritual activities with a sense of social identity in the ancient Maya city of Chichén Itzá, Yucatan.

[113] *Chair*

Hernandez, Amanda

[125]

It's the Pits!: Optimal Field Methods for the Location and Excavation of Prehistoric Roasting Pits in the Jornada Mogollon

This study will discuss methods and cost and time efficient ways of locating and excavating prehistoric roasting pits in the Jornada Mogollon Formative period (AD 200—1450). The National Historic Preservation Act mandates evaluating these sites for their potential to provide information important in understanding prehistoric behavior. Since most CRM investigations (surveys, testing projects, and data recovery) to discover and evaluate roasting pits, are time and budget constrained, it is imperative that a best practice method be implemented. This study is a comparative analysis of differing methodologies to locate and excavate a sample of sites with roasting pits on the southern foothills of the Sacramento Mountains in New Mexico. I will use ethnographic studies of roasting pit construction and use, combined with an investigation of site formation processes through time in an attempt to develop best practices to locate and excavate the pits. The approaches will be tested by using geophysical techniques and comparing magnetic gradient survey, electrical resistivity, and ground penetrating radar with ground truthing of anomalies. This study will contribute to an understanding of prehistoric wild plant processing and subsistence practices by elucidating patterning in roasting pit size, location, and function.

Hernandez, Alicia (University of Colorado at Boulder) and Gerardo Gutierrez (University of Colorado at Boulder)

[126] *The Archaeology of Fortified Hilltops along the Aztec-Tlapanec Frontier of the Fifteenth Century in Eastern Guerrero*

Fortifications are generally thought of as large structures with impenetrable walls, but this is not always the case; they can be extremely diverse in material, construction and intention. In this paper we examine the particular anatomy of a fortified archaeological site, Quimimiteopan, which is located along a contested area of Eastern Guerrero where Nahuas and Tlapanecs fought for almost three decades. An in depth analysis of Quimimiteopan and the morphology surrounding this native fortification allows us to understand the use of landscape and topography as a defensive strategy in Eastern Guerrero and its role in Mesoamerican warfare.

Hernandez Espinoza, Patricia (Centro INAH Sonora)

[46] *Social Stratification and Inequality at Tamtoc, SLP, Mexico*

The prehispanic city of Tamtoc, is located at Huasteca Potosina, between Ciudad Valles, San Luis Potosí and Tampico City, Tamaulipas, in Mexico. Archaeologists recognize three different occupation periods, first in 300 BC during the Formative, the second during the Classic period (400-600 AC), and the third, longer than the other two, during the Postclassic (1100-1400 AC). Scholars think that this ancient city was abandoned and reoccupied during these three occasions. Archaeological work done during past three years allowed the identification of two minor settlements, one from the Postclassic that seems to belong to an elite domestic unit and the other, a little village from the Late Classic that probably was Tamtoc's tributaries. Burial systems are different and skeletons recovered showed health differences that we hypothesized are related to living conditions and social inequality. In this paper, I analyze the health status of burials recovered at these two sites, focusing on answering the main question, were inequality and social differences truly responsible for health differences found in the skeletons recovered from these sites?

Hernandez Garavito, Carla (Vanderbilt University)

[235] *The Materiality of the Empire: Inka Presence in the Highlands of Lima, Peru, and the Complexities of the Material Record during the*

Late Horizon (1450-1532 A.D.)

Inka expansion in the Andes during the Late Horizon (1450-1532 A.D.) meant the consolidation of the largest native empire in South America. Recent archaeological research has measured the nature and strength of the Inka colonial system with the identification of specific "traits" in material culture –ceramic style, building type, architectural patterns – and the use of standardized official styles in conquered provinces. However, we hypothesize that the material evidences of Inka presence on the provinces gives an incomplete picture of the dynamics and relationships established during processes of conquest and integration. Using a comparative approach, we will evaluate the use of these traits as evidence of degree of control and imperial rule in the upper Lurin and Chillón valleys, in Lima, Peru. We propose that the identification of traits and standardized changes are not a good correlate for the complexities of both Inka strategies and local negotiations that characterized this period. Material changes caused by the Inka presence were highly variable and diverse from one province to the next. As a consequence, each region becomes an independent system, with highly particular mechanisms, networks, and materializations of the new political system that can only be explained from a more global perspective.

Hernandez Jimenez, Lourdes (Centro INAH Veracruz) and Olaf Jaime-Riveron (University of Kentucky)**[126] An Olmec Sacred Place: Materiality and Mural Paintings in the Upper Uxpanapa River System**

In this presentation, we describe the archaeological context, chronology, and material culture found in a cave which is a multi-component site of Southern Veracruz. Until now, it was unknown the use of karstic geology by the Olmecs and Classic of Southern Gulf Coast of Mexico groups as a place for rituals, mural paintings, feasting activities. We take into account the contextual meaning of a regional settlement pattern study for having a better understanding of this place. A study of pottery, lithics, zooarchaeological remains and comparison with the Olmec iconography allows us to provide new insights on the Olmec and Classic archaeological landscapes. Also, the genesis of the Southern Gulf Coast Writing systems is represented in this region of the Gulf Coast of Mexico in a cave system in which iconographic and glyphs were painted. A linkage between the Gulf Coast and Maya area is studied.

Hernandez-Estrada, Isaías (Escuela Nacional de Antropología e Historia/INAH)**[107] Los maestros escultores en barro de San Pedro Tlaquepaque y Tonalá, Jalisco.**

Los bustos labrados en barro han sido desde la segunda mitad del siglo XIX, uno de los distintivos identitarios tanto de los municipios de San Pedro Tlaquepaque como de Tonalá, Jalisco, de ahí que los clérigos y extranjeros buscaron aquellos escultores capaces de retratar la fisionomía e importancia de las personalidades de la época. Como parte de la arqueología es necesario analizar los artefactos u objetos manufacturados por las sociedades humanas. Contamos con dos heurísticas importantes para estudiar a estos maestros del barro, la arqueología histórica y la cultura material. Por último, se emplea el modelo de flujo propuesto por Michael Schiffer, con el fin de registrar procesos de manufactura y usos de herramientas. Esto nos permitirá en su momento crear hipótesis para contextos prehistóricos que buscarían explicaciones mediante la analogía registrada a partir de etnografía arqueológica.

Hernandez-Treviño, Teodoro [17] see Solis-Pichardo, Gabriela

Hernández-Treviño, Teodoro [17] see Schaaf, Peter

Heron, Carl [258] see Craig, Oliver

Herr, Sarah (Desert Archaeology, Inc.)**[218] Building Houses and Constructing Identities on the Edge of the Hohokam World**

Domestic architecture has been identified as a conservative and diagnostic marker of cultural association. In this paper, we explore the relationship between "house-in-pits," a form of domestic architecture used by the Hohokam, and the construction of social identity in core and peripheral areas of southern and central Arizona between A.D. 700 and 1100. We examine variation within this form of architecture, and how use of the house-in-pit articulates with other measures of Hohokam enculturation and identity, including ceramic production and distribution, spatial organization, and ritual participation. We will also consider the meaning of domestic architecture for frontier households.

[218] Chair

Herring, D. Ann [42] see Mant, Madeleine

Herringer, Susan [189] see Urban, Thomas

HERRSCHER, Estelle (Aix Marseille Univ, CNRS,LAMPEA UMR 7269, Aix-en-Provence, France), Frédérique VALENTIN (CNRS, ArScAn UMR 7041, Nanterre, France), Hallie BUCKLEY (University of Otago, Dunedin, New Zealand), Stuart BEDFORD (ANU, Canberra, Australia) and Matthew SPRIGGS (ANU, Canberra, Australia)**[27] Changing Subsistence Patterns during the First Millennium B.C. in the South Western Pacific**

Subsistence economies play a central role in the organization of societies, involving management of the environment, the development of beliefs, as well as affecting the mobility and demography of human groups. This paper aims to analyze the relationships between these factors through a bioarchaeological analysis of a sample of Lapita and immediately post-Lapita human groups from several Southwest Pacific archipelagoes. The chronologies of colonization, group mobility, and cultural traditions are well known for these island groups. Our sample includes 70 individuals from four archipelagoes (Bismarck, Vanuatu, New Caledonia, Fiji), which date to the Early Lapita, Late Lapita, and immediately post-Lapita periods. Stable isotopic data (carbon and nitrogen in bone collagen) and mathematical modeling are used to reconstruct diets at individual and group levels. Analysis of raw isotopic data and dietary isotopic modeling indicate an increase in the consumption of terrestrial items over time. Low trophic level items eventually become the exclusive type of terrestrial resource consumed. Various factors contributing to the adoption of new dietary habits during the immediate post-Lapita period will be discussed.

Herschend, Frands (Uppsala University, Sweden)**[55] Roland of Ellekilde**

In South Scandinavia during the first millennium CE, there are a number of sites that have recently come to stand out as small thematic and ideological landscapes. Typically, they are created over a short period of time before they are considered complete and lasting. A common Roman Iron Age situation is the village scene in which a dominant farm is situated alongside a small number of founders' graves, which for a long period make up the only grave monuments of the village. Behind the dominant farm a tail of dependent farms and households, attached to the village "twin head," complete these emblems of social order in cognitive landscapes. Grave grounds and monuments may also be arranged more independently as landscapes of afterlife and veneration – a case in point being the situation built up around the burial mound of the heroic horn blower from Ellekilde. In this prosperous Roman Iron Age countryside, just west of Copenhagen, an early model of male and martial virtue attracted 30 odd graves during a five- or six-generation period ca. 250 to 400 CE. The horn blower and his fate were illustrated by the

installation in his grave chamber – his afterlife venerated by tradition.

Herzog, Nicole (University of Utah) and Ashley Grimes (University of Utah)

[87] *Where Have All the Tubers Gone? An Experimental Approach to Identifying USO Exploitation in the Great Basin*

Investigating the timing, handling mechanisms and archaeological signatures of plant use is of increasing importance wherever questions of dietary reconstruction are concerned. In the Great Basin, this problem has received much attention, but little has been done to experimentally define the archaeological signature of USO (underground storage organ) use. Using plant samples from a representative set of USOs (*Lomatium* sp. (biscuit root), *Perideridia* sp. (yampa), *Calochortus macrocarpus* (Sego Lily) and *Allium* sp. (wild onion)) we aim to 1) identify traditional plant collection and processing techniques using ethnographic resources, 2) experimentally replicate traditional processing techniques, 3) identify the archaeological signatures resulting from these forms of processing and, 4) identify the appropriate methodologies for analyzing the processing signatures. Broader implications include the development of standardized methods for the recognition and analysis of tuber exploitation. Results will provide useful guidance for examining dietary expansions involving the uptake of ethnographically important resources such as USOs.

Hesler, Liana Staci [169] see Martin, Lucius

Heukelbach, Jorg [272] see Arriaza, Bernardo

Hicks, Brent (Historical Research Associates)

[29] *Legislative and Business Influences on Our Understanding of American Archaeology*

Many of the geographically largest archaeological projects conducted in the United States have occurred due to requirements for compliance with the National Environmental Policy Act (NEPA) and the National Historic Preservation Act (NHPA). Where these projects occurred, the archaeological record swelled with greater amounts and more kinds of archaeological data that often led to substantial revisions in the culture history, paleoenvironmental record, and recognition of site/feature types in that region. In the next decade, the collections resulting from such large projects were plumbed for numerous dissertations and theses that focused on particular assemblages, features, and environmental reconstructions particular to their locales. This represents a major bias in regional archaeological records because such projects' topography and other environmental contexts are not necessarily representative of the balance of the region. Using the Columbia Plateau as an example region, this paper explores the factors of the timing of release of the regulations implementing NEPA and NHPA, combined with cycles of business/agency investments that followed, that limited the spatial representation of the greatest expansion of the American archaeological record.

Hicks, John (Univ. of Illinois at Chicago/The Field Museum)

[58] *IR Spectroscopy and Brewery Sediments at Cerro Baúl, Peru: An Exploratory Geochemical Study*

Infrared (IR) spectroscopy is a common technique for identifying the composition of molecular compounds in archaeological materials, such as ceramics, textiles and pigments (Bikiaris, et al. 2000; Derrick, et al. 1999; Zorba, et al. 2007). Until recently, it has had little application in the analysis of archaeological sediments and features due to the complexity of data output and the degradation of organic content that commonly occurs in many archaeological contexts (Pollard, et al. 2007). This paper presents

an exploratory application of Fourier-Transform IR spectroscopy (FTIR) to soil samples collected from the brewery structure at Cerro Baul, a Middle Horizon (AD 600-1100) Wari site in Moquegua, Peru. I hypothesize that the brewery's sediments retain the chemical traces of (a) the processing and storage of organic materials used in the production of chicha (e.g., maize, molle berries), (b) microscopic remnants of the fermentation vessels, and (c) the pigments and compounds used to decorate the vessels (e.g., red ochre). I present the analytical results of the FTIR analysis and discuss the viability of IR spectroscopy for soil analysis.

[58] *Chair*

Higgins, Rebecca [71] see Judd, Kathleen

Higgins, Howard (TRC Environmental Corp.)

[262] *Ethnographic Consultation for Renewable Energy Development in the San Luis Valley, Colorado*

As part of on-going planning for renewable energy development in the San Luis Valley, Colorado, the BLM commissioned an ethnographic study of the Hispanic descendants and the Native American tribes that were traditionally active in the area. This paper details the approach taken in the study (including preliminary contacts, interviews with elders, field visits, and documentation of results). Ultimately, during the course of the study, over 40 Hispanic descendants were interviewed and consultation was undertaken with more than 25 tribes. The results included documentation of rock art sites of significance to multiple Native American groups, sacred sites/traditional cultural properties (some of which are threatened by recreational activities and proposed developments), a geoglyph, and resource acquisition areas. The paper concludes with thoughts about how to conduct such studies, the importance of such early ethnographic research for the identification of archaeological resources and explication of components of these resources, and the use of such studies to create on-going beneficial partnerships between the local community, the Native American entities traditionally using the area, the professional community and the land managing agencies.

Highcock, Nancy (New York University)

[223] *The Royal Tombs at Nimrud: Jewelry and Status in the Afterlife of the Neo-Assyrian Queens*

The encapsulating image of the Neo-Assyrian empire is that of the king, imbued with both "martial prowess and individual piety", a figure upon whom the very existence and preservation of the empire rested. This construction of the king as omnipotent and omnipresent, paired with the relative lack of images of royal women, has produced an incomplete portrait of life in the 1st millennium royal household. The discovery of Neo-Assyrian queens' tombs in the late 1980s should alter this view. By analyzing the luxury items recovered from the queens' tombs, this paper addresses status amongst the royal women within the very specific context of burial practices. Many studies on the Neo-Assyrian queens have focused on the textual references to royal women; but the archaeological evidence, which includes the personal items and jewelry of the queens, will greatly bolster our knowledge of how these women operated both within the palace and on their journey to the afterlife. In fact, by juxtaposing the mortuary evidence with both mythological and documentary evidence, it becomes clear that personal items such as ceramics as well as objects of personal adornment were used to negotiate and re-negotiate royal female agency and social status even after death.

Higuera, Alvaro (Simon Fraser University)

[111] *Indigenous Amazonian Societies in Distress: Monitoring Heritage Risk and Social Decay in the Peruvian Amazon*

In this paper I will discuss the difficulties in the issue of recognition of the intangible heritage in Lowland populations in Peru. Lowland populations of the Peruvian Amazon Basin have an important material record but the immateriality of their traditions, such as the use of large tracts of land for their nomadic settlement traditions, are essential to their survival. The devastating effect of mining in the highlands has immediate consequences in the livelihood of the populations downstream. In addition, Lowland populations have found themselves in a disenfranchised position in comparison to the highland native populations, which have a higher degree of legal recognition and are integrated in the market economy. This is a topic that combines anthropology, legal issues and politics. In addition, archaeology has contributed timidly to the documentation of the material record of these population. However, it is in the realm of intellectual property as much as on the physical usufruct of the land that lies the wealth of these societies. The integrity of the latter insures the persistence of the former.

[192] *Discussant*

Hildebrand, Elisabeth (Stony Brook University) and Steven Brandt (University of Florida)

[10] *Negotiating Trade-Offs in Establishing Standards for Data Resolution and Inter-Site Comparability: Insights from Two Projects in Eastern Africa*

Anthropological synthesis entails comparing data across geographic/temporal spans. Archaeological data from different sites are often not comparable due to disparate goals, intellectual traditions, qualitative/quantitative methods and logistical constraints. Differing data sources and degrees of temporal/spatial resolution impede application of uniform data standards across time periods and fieldwork stages. The evolution of two projects in eastern Africa clarifies these challenges and offers potential solutions. At Mochena Borago Rockshelter, SW Ethiopia, state-of-the-art excavation/documentation methods employed since 2006 have yielded the region's first chronometrically secure Late Pleistocene (>50-38ka) technological sequence. In NW Kenya west of Lake Turkana, initial surveys in 2008 were followed by test excavations in 2009, revealing megalithic sites associated with early herding ~4ka. Full-scale excavations in 2012 demonstrated inter-site differences. Each field season witnessed progressive improvements in spatial/temporal resolution as logistics also improved. Adopting internal data standards has proved challenging for both projects: specialists with different geographical/theoretical backgrounds and analytical objectives hold diverse opinions about trade-offs between spatial resolution vs. excavation speed and other issues that require compromises. Both teams struggle to compare new data to those from prior projects in the region. These internal tensions/resolutions exemplify larger dilemmas in the creation of data standards for the discipline.

Hildebrandt, William (Far Western Anthropological Research Group)

[12] *Territorial Expansion of Wintu Tribelets in North-Central California during Late Prehistoric and Ethnohistoric Times*

Historical linguistic, ethnographic, and archaeological data, combined with evolutionary ecological theory, are used to document and explain how Wintu populations expanded their territories over time, taking large tracts of lands from their neighbors. These analyses show that areas with high ranking fisheries were the targets of this expansion, and that the acquisition and maintenance of these lands were often associated with high degrees of violence.

[12] *Chair*

Hill, Erica (University of Alaska Southeast)

[14] *Personhood and Agency in Eskimo Interactions with the Other-than-Human World*

Protohistoric Yup'ik and Inupiaq Eskimo of Alaska and the Bering Sea coast inhabited a complex social world populated by a variety of creatures. Some of these creatures possessed personhood, lived socially, and acted as agents. Using zooarchaeological evidence and oral narratives, I explore the intersection of agency and personhood in Eskimo relations with animals and some of the other-than-human beings that inhabited the enculturated landscapes of the Bering Sea Coast. I suggest that Eskimo differentiated between agency and personhood, and that those differences had implications for human behavior while hunting, traveling, and foraging. Knowledge and practice of these "ritual" behaviors was part of the complex social world of everyday life. In small-scale Eskimo societies, issues of agency and personhood were relevant to everyone, whether man, woman or child, and so should not be relegated to the more limited category of either "shamanism" or "the supernatural."

Hill, Mark (Ball State University)

[39] *Changing Social Structures of the Late Archaic: Network Analysis of Mortuary Populations from the Reigh and Riverside Sites in the Northern Lake Michigan Basin*

Systems of long-distance exchange and interaction in the North American midcontinent expand greatly during the Late Archaic and Early Woodland periods. A body of evolutionary theory predicts that such expansion is likely to be accompanied by important social changes affecting gender roles, status, and marriage rules. This prediction is explored using network analysis of mortuary populations from two sites occupied before and after this exchange system reached the northern Lake Michigan basin. At the late Middle Archaic Reigh site, the early population appears as a community in which male social roles and achievement are most prominent. Later, and after the expansion of the Red Ocher interaction network into the region, the Late Archaic Riverside site represents a community in which it is children and females that have the most prominent position in the social network. These results support the theory's prediction that the expansion of interaction networks is accompanied by marked social changes affecting gender roles and the importance of lineage.

Hill, David (Metropolitan State University of Denver) and Deni Seymour (Research Associate, Jornada Research Institute, Ne)

[75] *Issues for Dating Numic and Athapaskan Occupations in the Southwest*

Key issues regarding Numic and Athapaskan occupations in the Southwest relate to the timing and routes of arrival of each of these groups. Important elements of the argument involve connecting chronometric evidence to a distinctive subset of material culture and distinguishing between contemporaneous groups. Equally important is confidence in actually and accurately dating the target events and understanding the protracted and intermittent nature of the process. At the same time, evidence of interaction between groups provides one important key to chronometrically targeting their mutual presence in the region. Special problems are presented for dating mobile group sites where the solution will require innovative approaches and new conceptualizations involving mobile group behavior that requires different ways of understanding and using chronometric evidence.

Hill, Katherine (Hamilton College), Nathan Goodale (Hamilton College), Alissa Nauman (Hamilton College) and David B. Bailey (Hamilton College)

[120] *Elemental Characterization of Floor Sediments from Housepit 54, Bridge River Housepit Village, British Columbia*

Elemental characterization of sediments from living floors can aid in establishing past spatial organization and human behavioral adaptations. In this study, we utilize EDXRF and WDXRF techniques to examine floor sediments collected from the BR4

occupation of HP54 at the Bridge River housepit village. During excavation, HP54 was systematically sampled (N=40) for sediments across a floor associated with the historic Fur Trade. We detail our methodology for sample preparation to obtain reliable XRF data and use geospatial tools to examine the results. Results suggest that elemental composition of sediments from floor contexts can be a valuable tool to examine changing uses of space within houses with multiple occupations.

Hill, Genevieve (University of Exeter)

- [137] *The Problem with Northwest Coast Wet Sites: An Examination of Emic and Etic Approaches to Wet Site and Wetland Archaeology*

This paper examines the reasons why wet sites and wetlands are often overlooked in consulting archaeology on the Northwest Coast of Canada. Differences between emic and etic perspectives on the significance of wetlands in are considered. Current heritage legislation and traditional archaeological practice in this area is based on western etic criteria which regards wetlands as inhospitable places not fit human habitation, and wet sites as rare occurrence with a large price tag. A case study of Island Hul'qumi'num oral tradition and traditional knowledge indicates that wetlands play a critical role in their culture history, acknowledges the possibility of encountering wet sites in their traditional territory, and calls for their appropriate treatment. An approach incorporating oral history and traditional knowledge into the foundations of research design through the critical examination of existing ethnographic sources and archaeological methods has the ability to identify and appropriately examine areas deemed significant by First Nations.

Hill, Matthew [183] see Wismer-Lanoë, Meredith

Hilmy, Adrien, Alissa Nauman, Nathan Goodale and David Bailey

- [184] *Measuring the Matrix: An Analysis of Elemental Composition in Cultural Sediments from the Slocan Narrows Pithouse Village, Upper Columbia River Drainage, British Columbia, Canada*

Variation in the composition and intensity of elements in an archaeological matrix can offer information concerning occupation intensity and use of space at an archaeological site. Using portable x-ray fluorescence technology (pXRF), this study examines sediments collected from cultural contexts at the Slocan Narrows Pithouse Village, a community located within the Upper Columbia River system dating c.a.3100-250 cal B.P., in effort to identify variation in composition and intensity of major and trace elements. Samples were obtained in housepit matrices associated with 14C dated materials enabling intra-site comparisons of occupation intensity between contemporaneous and non contemporaneous households. Variation in samples obtained from different contexts in a single a housepit dating to 1050 cal B.P. may offer information concerning the use of space within this structure.

Hilo, Regina

- [280] *E ola ka Hawaii: Perpetuating Hawaiian Culture*

The Hawaiian Renaissance culminated in the 1970s, as much a renewed interest in all aspects of traditional Hawaiian life as a movement of Hawaiian nationalism, unified in opposition to commercial tourism and wide-spread land development. Malama 'āina (land stewardship) and 'ōlelo Hawaii (Hawaiian language) are two that have remained central to the revitalization and modernization of Hawaiian culture. Hawaiian nationalism is now prevalent in academia, with most

such academics fluent in the Hawaiian language. Indigenous Hawaiian archaeologists with Hawaiian language skills bring a new perspective to academia and cultural resource management, including proper cultural protocol, traditional practices, and accessibility to un-translated Hawaiian language materials at the highest levels of scholarship. While there is still deep mistrust of archaeology in the Hawaiian community, Hawaiian archaeologists are valuable community and professional liaisons.

Restoration of archaeological sites is central to reconnecting local communities with the rich archaeological heritage right outside their backdoors. Preservation of archaeologically-significant and culturally-significant sites reinforce the importance of malama 'āina. Engaging local cultural practitioners in the processes of preservation and restoration aids in our reconstruction of past cultural landscapes while also perpetuating traditional Hawaiian traditions.

Lawe i ka ma`alea a ku`ono`ono. Take wisdom, and make it deep.
[280] *Chair*

Hingley, Richard

- [24] *A Chorography of Becoming for the Northern Frontier of England*

This paper arises out of the 'Tales of the Frontier' and the 'Life of the Frontier' initiatives. It explores the concept of chorography, applying it to the transformation of the border landscape that lies between the modern countries of England and Scotland. Chorography explores the interface between the present and past in the context of place (cf. Marchitello 1997, 78). The concept has been drawn upon by archaeologists to address the ways that monuments and artifacts have been actively drawn upon to create new meaning (cf. Rohl 2011; Shanks and Witmore 2010). This paper explores the re-creation of the complex Roman frontier monument called Hadrian's Wall and the uses to which this ancient structure has been put in the building of border-relations between the two countries from the sixteenth century to the present day (Hingley 2012a; Hingley 2012b). It explores how this frontier was transformed through the reconstitution of its ancient materiality in new territorial circumstances.

Hirasawa, Yu

- [141] *Difference and Uniqueness of Hokkaido Prehistory: Ethno-Historical Development and Relationship among Ainu and Past Prehistoric Cultures*

Hokkaido is the most northern island in Japanese archipelago. As with other islands in South, we can trace the human existence and cultural shifts since Upper Paleolithic period based on Archaeological and Historical evidences. However, because Hokkaido has a different vegetational regime and environment, its history of cultural diversity contrasts markedly with other parts of Japan. In addition, Hokkaido is the homeland for Japan's indigenous Ainu population. Although Ainu research has been a dynamic part of Japanese archaeology since the discipline started, conceptions of Indigenous Archaeology remain new to Japanese archaeology. One key point here is how Ainu archaeology develops its own methodology and theory. Although Ainu people are now officially regarded as Indigenous group in Japan by the government, their participation in archaeology and cultural heritage heritage management remains weak. This paper discusses historical and cultural connections between prehistoric cultures and Ainu groups with using archaeological evidence, and illustrates the importance of Ainu people's role in the Indigenous Archaeology in Hokkaido.

Hirschi, Jaynie [87] see Duke, Daron

Hirth, Kenneth (Penn State University)

- [63] *Discussant*

Hiscock, Peter (Australian National University)

[28] *Australian Lithics and Environmental Change*

This paper summarizes some of the intriguing features of Australian lithic assemblage variability through time and space, and presents new, large-scale descriptions of the patterns. The structure of lithic production systems is discussed in the context of palaeoenvironments and some general processes identified.

Hitchings, Philip and EB Banning (University of Toronto)

[58] *Bayesian Archaeological Survey in Wadi Quseiba, Jordan: An Iterative Predictive Model*

The design of archaeological surveys continues to be a program under consistent development. Sampling and digital spatial analysis continue to be at the forefront while the truism that prehistoric landscapes differed vastly from those of the present fails to capture as much attention as is due. Survey by the Wadi Ziqlab Project demonstrates that portions of the landscape in Jordan where prehistoric sediments formed are only sparsely preserved. Much of these deposits has been destroyed by over 8000 years of down-cutting of the stream channel, leaving only small terraces stranded some way up the side of the modern valley, often covered by more recent colluvium. This phenomenon has been observed in many parts of the world, but knowledge of its effects has not guided most surveys or the practice of archaeological predictive modeling. With this in mind, recent survey in Wadi Quseiba, Jordan incorporated GIS methodology to determine where prehistoric material was likely to have survived and Bayesian statistical methods and "sweep widths" to iteratively predict the most likely places where material could be located. This survey design seeks to improve the rate of recovery of prehistoric material upon which sound interpretation of past life ways can be made.

Hitte, Christophe [20] see Ollivier, Morgane

Hocking, Sara (University of Montana)

[120] *Lithic Technology at Housepit 54 during the Fur Trade Era: Testing a Central Place Foraging Model*

This poster addresses lithic technological organization during the Fur-Trade era occupation at Housepit 54 of the Bridge River Site. Specifically, it outlines the construction and testing of a central place foraging model examining variability in field processing and transport of toolstone for several known sources. It is expected that materials derived from distant sources will be dominated by smaller flakes and include tools with more intensive retouch and evidence for frequent use. Technological and functional analyses demonstrate variability in economic approaches to quarry, transport and use of lithic raw materials from this housepit.

Hodder, Ian [9] see Pitter, Sharmini

Hodder, Ian (Stanford University)

[32] *Assembling Çatalhöyük: Theory and Practice*

The interactions between the 160 researchers in the 36 different specialisms within the Çatalhöyük Research Project are informed by overall project aims and structures, but laboratories and researchers have considerable autonomy. In such 'flat' work environments, the notion of assemblage seems particularly appropriate. Within archaeology the term assemblage refers to association of objects (often produced elsewhere) in a specific context. Within philosophy and social theory, the term assemblage is often used, as a result of the work of authors such as Deleuze and Guattari, DeLanda and Bennett to refer to the contingent ways in which juxtapositions of usually separated elements lead to the emergence of new knowledge. At Çatalhöyük, collaboration

between usually separated specialisms has produced contingent alliances and co-workings that easily transform. The arguments that emerge do not come about solely from the top-down testing of hypotheses and expectations worked out before-hand; rather the arguments emerge through the process of interlacing and braiding across and between domains. These boot-strapping operations can lead to dissonance as the different types of data are shown to be misaligned, or they can lead to strong and robust arguments as three to four different types of data are assembled that fit together.

[65] *Discussant*

Hodgetts, Lisa [263] see Morris, Zoe

Hoedl, Lucas (University of Colorado Denver)

[234] *Shades of Black: Obsidian Distribution and Social Organization in the Tequila Valley Region of Jalisco, Mexico during the Late Formative and Early Classic Period*

The Teuchitlán tradition of West Mexico has often been overlooked within the greater context of Mesoamerica; nevertheless, western Mexico contains a rich and vibrant cultural history. This Poster expands our limited understanding of the Teuchitlán tradition by examining the role of obsidian distribution in the development of social identity for the Teuchitlán cultural group at the Late Formative and Early Classic Site of Navajas. I examine how familial groups were using visually distinct obsidian to develop and distinguish their position within the social order. The data derived through the use of visual identification and chemical analysis of the obsidian distributed at Circle 1 and Circle 5 at Navajas was able to provide insight into social organization and social divisions within the Teuchitlán system.

Hoerig, Karl [110] see Welch, John

Hoerman, Rachel (University of Hawai'i-Manoa)

[249] *Exploring the Informative Potential of Southeast Asian Rock Art Technologies*

Rock art research is a burgeoning archaeological sub-discipline, and rock art data a promising source of archaeological information in Southeast Asia. Using data drawn from a variety of sites throughout the region, this paper reviews evidence for the possible non-metal technologies used in the creation of Southeast Asian rock art. The resultant hypothetical rock art technologies are contextualized against their various chronological associations, stylistic horizons and cultural affiliations. The informative potential of non-metal technologies likely utilized in the creation of rock art are also evaluated through their ability to address issues of ancient human movement, creativity, interaction and adaptation throughout the region.

Hoffecker, John [206] see Darwent, John

Hoffer, Christine [210] see Lentz, David

Hoffman, Brian (Hamline University), Nancy Hoffman (Minnesota Historical Society), Kevin Reider (Hamline University) and Chelsea Starke (Hamline University)

[94] *Collaborative Archaeology/Collaborative Education*

Collaboration between archaeologists and descendant communities, stake holders, and indigenous scholars has played an important role in the evolution of archaeological practice in recent years. One result of these collaborations is that there is shared participation in designing research, interpreting results, and managing cultural resources. Our collaboration at the Jeffers Petroglyph Historic Site in southwestern Minnesota, as part of the Hamline University archaeology field school, has expanded this

model of shared participation into the educating my field school students. Our approach allows collaborators to define the student experience and learning outcomes based on different pedagogical agendas.

Hoffman, Nancy [94] see Hoffman, Brian

Hoffman, Laura (SWCA Environmental Consultants) and John Dietler (SWCA Environmental Consultants)

[102] *Water at the San Gabriel Mission and the Intensification of Production: The Industrial Revolution Comes to California*

The San Gabriel Mission grew from a small farming community at its founding in 1771 to one of California's most economically successful enterprises in the 1820s, producing a tremendous surplus of goods for export. The success of the mission economy was tied directly to the use of water for transforming raw materials into trade goods. First established on the fertile banks of a major river, the mission was soon inundated by floodwaters. The padres relocated to an area that was away from the threat of floods, but was also away from major water sources.

Our data recovery excavations in 2011-2012 revealed four distinct stages in the technological development of water conveyance and storage systems, and of harnessing hydraulic energy.

Archaeological evidence shows a clear progression at the mission from the utilization of a natural waterway for irrigation, to the use of large reservoirs, and finally to the construction of a massive masonry channel and a highly efficient water-powered gristmill. This paper explores the intensification of production at the San Gabriel Mission through the evolution of water-powered technology, including the 1823 construction of Chapman's Mill, which arguably brought the Industrial Revolution to California.

Hofkamp, Anthony (Portland State University) and Virginia Butler (Portland State University)

[68] *Using X-rays, Surface Images, Thin Sections and ICP-MS to Validate Incremental Growth Ring Analysis for Age Determination of Chinook Salmon (*Oncorhynchus tshawytscha*)*

Analysis of incremental growth rings (IGRs) in archaeological salmon vertebrae has been used to estimate fish age and in turn identify species and season of capture. Efforts have focused on using X-ray images to view the internal structure of vertebrae, assuming this portion exhibits the same growth patterns visible on the surface. This method has not been validated using modern fish of known age. Our research tests three potential sources of error: First, true annuli, or yearly growth increments, may be difficult to detect due to the formation of "growth checks" associated with environmental stresses in the first year of life. Second, it is possible the X-rays commonly used for viewing IGRs in archaeological specimens are not capturing the same aspect of vertebrae commonly used in fisheries biology. Third, hatchery specimens used in validation studies may not exhibit the same growth patterns as wild fish. To understand potential sources of error and firmly establish if IGRs represent years of growth this project develops a criteria for true annuli and tests these criteria on a collection of modern Chinook salmon of known age (N=126). Four methods of analyzing IGRs are evaluated including X-ray images, surface photographs, thin sections and ICP-MS.

Hofman, Jack [28] see Sellet, Frederic

Hofman, Courtney (University of Maryland)

[172] *Archaeogenomics and Ancient Animal Translocations on California's Channel Islands*

One of the greatest environmental impacts of ancient people was the introduction of both domestic and wild species to non-native habitats. Recent globalization has led to the rapid spread of non-native species, but the movement of organisms through trade

networks and human migration extends deep into the human past. Using ancient DNA and high throughput sequencing methods, we are investigating possible ancient human translocation of the endangered island fox (*Urocyon littoralis*) and other species on California's Channel Islands. The Channel Islands contain some of the earliest human occupations in coastal North America at 13,000 cal BP and some of the most populous hunter-gather groups in the world with extensive trade networks between the islands and mainland. Our recent island fox study, along with our previous analysis of deer mice (*Peromyscus nesodytes* and *P. maniculatus*), suggests that both predators (foxes) and their prey (mice) may have been introduced to the islands by human translocation. Archaeogenomic data are well suited to improve knowledge of historic and prehistoric organisms, possible ancient intended and accidental translocations by humans, and broader human-environmental interactions by helping document long-term evolutionary patterns and informing decisions to protect, preserve, and restore biodiversity.

[172] *Chair*

Hofman, Corinne

[292] *Kalinago Connections: Archaeology and Legacy of Colonial Encounters in the Lesser Antilles*

From 1492, the Caribbean was the center stage for interactions between cultures of dramatically different backgrounds. In the Lesser Antilles 150 years of indigenous resistance to European colonization, and the influx of African slaves beginning in the 16th century led to the mixing of biological ancestries and the formation of new identities and social and material worlds. Descendant communities of the Carib or Kalinago survive to this day in some of the islands. Our knowledge of the beginnings of this unsettled history is foremost based on descriptions by 15-18th century European chroniclers, who provide vivid, but heavily biased and fragmented accounts on the indigenous inhabitants and ultimately of their responses to European and later African incursions into their world.

Recent archaeological investigations in some of the main Kalinago strongholds in the Antilles have for the first time uncovered 16-18th century Amerindian settlement remains and associated material culture repertoires. These discoveries provide important insights into the transformations of indigenous cultures and societies and inter-cultural dynamics at play in the advent of European colonialism. This paper engages with Kalinago archaeology and legacy and particularly considers the frameworks for heritage awareness and protection in the geopolitically diverse (is)landscape of the Lesser Antilles.

[254] *Discussant*

[292] *Chair*

Hogan, Patrick [224] see Worman, F. Scott

Högberg, Anders (Linnaeus University)

[72] *Meeting an Elderly Audience through Community Archaeology within CRM*

Life-long learning is a challenge to established public archaeology / community archaeology. Elderly people's learning styles and desires is different from, for example, school children's. The reason senior citizens engage in archaeology and learning issues can radically differ from why other groups do so.

In this paper I present experiences from working with public archaeology / community archaeology within CRM-archaeological projects, meeting Swedish local historical societies whose members are primarily senior citizens. Based on an analysis of these experiences I present some results on what it is that happens when working with the past gives meaning to the everyday life of people not active in the labour market. I inquire into questions such as: What happens to archaeological knowledge

production when focus is shifted from knowing the past to giving social meaning in the present? What kinds of meaning for the past in the present are held by the participants? How can heritage and community archaeology engage to empower senior citizens and improve the well-being of people of all ages?

Hoggarth, Julie (University of Pittsburgh)

- [256] *Using Multivariate and Quantitative Methods for Understanding Diachronic Change: Classic to Postclassic Household and Community Dynamics at Baking Pot, Belize*

Methods for building chronologies and understanding diachronic change are varied, relying primarily on absolute and relative dating methods, such as ceramic seriation and radiocarbon dating. While these methods are essential for clarifying chronological occupation, identifying changes in multiple artifact classes and features can build upon these methods and provide a dynamic view of social change through time. This paper focuses on using a multivariate, quantitative approach to building chronologies to understand diachronic change, utilizing multiple type of archaeological evidence together to identify household and community level change at Baking Pot, Belize. By examining changes in architecture (size, height, volume, quality of construction materials, and architectural elaboration), ritual deposits (caches, offerings, and burials), and the proportional distribution of ceramics, trade goods, and ritual paraphernalia, I examine how commoner households adapted to and participated in social reorganization during the Late Classic, Terminal Classic, and Early Postclassic periods.

Holdaway, Simon [5] see Lin, Sam

Holdaway, Simon (University of Auckland)

- [129] *Mid-Holocene Neolithic Landscape Archaeology of the Northern Fayum, Egypt*
The Fayum was recognized as the source area for understanding the 'origins of agriculture in Egypt' based on the early 20th century work of Caton-Thompson. Here we report on new research in the northeast of the Fayum basin adjacent to paleolake shores, the location of Koms W and K originally excavated by Caton-Thompson. Our research is focused on the nature of human environmental interaction during the period when domesticates were first introduced. The landscape today is arid and heavily deflated but has a rich surface archaeological record in addition to stratified deposits. To understand the nature of paleoenvironment, subsistence systems, mobility, sedentism and landscape use an integrated multidisciplinary approach is applied. We outline the results of current work focused on understanding the distribution of archaeological materials in relation to the ancient lake shores.

[129] *Discussant*

Hollenbach, Kandace [54] see Boudreux, Edmond

Hollinger, Melody (Epsilon Systems Solutions, Inc.)

- [206] *There's Gold in Them Thar Land Patents! How Homesteading Changed a Landscape: A Database of Land Patents for Area Now Encompassed by NAWS, China Lake*

Historic documentation, such as land patents, can be an incredibly rich resource for understanding past occupants and patterns of land use. The Naval Air Weapon Station (NAWS), China Lake (southern California) encompasses over one million acres, divided into the North and South ranges. A fair portion of this area was registered for land patents through the US federal government. In addition to rich prehistoric resources, this area contains places of significance during the westward expansion, the California Gold Rush, and the Great Depression, until the founding of NAWS in 1943. This newly created database (and associated GIS layer)

draws together the registered land patents for the North Range. Although these records are publicly available, they are rarely utilized to their full potential. This database allows for an investigation into the frequency and distribution of land patents for demographic, temporal, and geographic trends on a regional scale. A brief examination into some of these trends is provided.

Holly, Donald (Eastern Illinois University)

- [230] *Richard Gould's Contributions to Hunter-Gatherer Studies*

Richard Gould devoted the first 20 years of his career to the study of hunters and gatherers. His work focused first on the Tolowa of Northern California and then on the Western Desert aborigines of Australia. Appropriate to a Berkeley trained anthropologist, Gould applied a broadly inclusive anthropological approach—incorporating ethnohistory, ethnography, and archaeology—to his research on hunters and gatherers. It was his wedding of ethnographic observation with an archaeologist's sensitivity to material culture, however, that would make his work famous and contribute to the development of the field of ethnoarchaeology. This paper examines the influence of Gould's research on hunter-gatherer studies, archaeological theory, and my own intellectual development.

[230] *Chair*

Holt, Emily (The University of Michigan)

- [96] *Social Complexity and Sustainable Resource Use: A Case Study from Bronze Age Sardinia*

During the Late and Final Bronze Age (1365-1020 BCE), the Nuragic culture on Sardinia developed into an impressive complex society with a program of monumental building and cultural contacts that reached to the Levant. However, monumental building ceased at the end of the Final Bronze Age, and by the Early Iron Age (1020-900 BCE), the Nuragic culture seems to have experienced a decrease in organizational complexity. The monumental nuragic towers were allowed to collapse, settlement was disrupted at many sites, and some sites were abandoned altogether.

This paper will consider the political economy of Nuragic society from the perspective of environmental archaeology. It will use new excavated evidence including palaeobotanical remains, phytoliths, wood charcoal, and fauna to reconstruct the environment at an early Nuragic site. It will identify subsistence and prestige strategies and assess the level of human impact these strategies had on the local resource base during the site's occupation. Ultimately, this paper will ask whether the political economy of Nuragic society was sustainable and consider the implications of this question in light of the severe cultural disruptions that occurred during the Final Bronze Age and Early Iron Age.

Holtorf, Cornelius (Linnaeus University, Kalmar, Sweden)

- [72] *Introduction: Archaeology, Cultural Heritage, and the Third Age*

This paper introduces the symposium by discussing the pertinence of focussing on elderly citizens in relation to archaeological heritage. I will be discussing two main issues. First of all, major demographic and economic changes have been resulting in an ever larger part of the population being more than 60 years old while still healthy and relatively well off. What are the desires, needs and legitimate rights of these people in their third age?

Secondly, it is widely recognized that cultural stimulation and inspiration can contribute to improving the well-being and rehabilitation of patients suffering from various diseases and conditions related to old age. What is the overall potential of cultural heritage for improving the quality of life people in their fourth age?

[72] *Chair*

Holz, Barbara (Desert Research Institute)

[122] *A Cold War Battlefield: Frenchman Flat Historic District, Nevada National Security Site, Nye County, Nevada*

Frenchman Flat was one of the cold War's hottest battlefields. Frenchman Flat is located on the eastern side of the Nevada National Security Site, formerly known as the Nevada Test Site. The cold War material remains of Frenchman Flat are concentrated on its 4.5 square mile dry lake bed. Fourteen atmospheric nuclear weapons were detonated over the dry lake playa via airdrop, balloon suspension, tower emplacement, and an artillery cannon. Military and weapons effect planner tested bunkers, hangars, windrows, and building materials to determine their survivability. Today, the ruins are concentrated in wreckage that boasts of extraordinary power. Most were targets for both civil and military effects test project and include domes, block, window frames, animal pens, a railroad bridge, and underground parking garage, and a bank vault. Infrastructural remains, such as towers and bunkers, account for a significant number of the structures and buildings. This is the archaeology of Frenchman Flat on the Nevada National Security Site. It is a landscape so indelibly marked by 20th century weaponry that time along will not erase the effects.

Hommel, Peter [93] see Doonan, Roger

Hommel, Peter (Institute of Archaeology, University of Oxford), Peter Day (University of Sheffield, United Kingdom), Peter Jordan (University of Aberdeen, United Kingdom) and Viktor Mikhailovich Vetrov (Irkutsk State Pedagogical University, Russian Fede)

[258] *Vessels of the Vitim: A Study of Ust'-Karenga and Ust'-Yumurchen Ceramics*

Recognition of the pivotal role of hunter-gatherers in the invention, adoption and dispersal of pottery has led to a revival of discussions about the social, economic and political significance of early ceramic technology. Though important, these general and theoretical discussions are often based heavily upon untested assumptions and detailed analyses of early assemblages, their production, use and deposition remains rare. This paper presents the results of a study of hunter-gatherer pottery from the Upper Vitim Basin (Eastern Siberia). It attempts to assess the potential contribution of an integrated, analytical-interpretive approach to our understanding of the lives and lifestyles of these communities and the roles of pottery within them. Using macroscopic examination and ceramic petrology, supplemented by a range of secondary techniques, this study investigated the variability seen in two distinctive cultural assemblages. Its results are presented and considered with reference to available archaeological and geological information and existing socio-economic models. Changing patterns of technological choice and raw material exploitation are identified and their possible significance explored with reference to group mobility, the temporality of production and the general availability of resources. Though further research is necessary, the value of this kind of approach to the study of early pottery seems clear.

Hommon, Robert

[255] *The Kealakekua Region: Salubrious Core, Political Center*

Archaeological, ethnohistoric, and oral traditional resources of the region around Kealakekua Bay on the Kona coast of Hawai'i Island offer unsurpassed perspectives on ancient Hawaiian society and the nature and emergence of the Hawaiian primary states. Supported by abundant marine resources and highly productive agricultural lands that became a section of the vast rain-fed Kona Field System, the region's communities, probably among those that founded the 2,000 km² Kona District, became a center of the

island's peripatetic royal court and of the annual four-month Makahiki festival. Much that we know of this court, this festival, of commoners, priests, and rulers who resided there, and a great deal more about the Kealakekua region and the larger Hawaiian world at the moment of contact with the non-Polynesian world comes from dozens of graphic depictions and written eyewitness accounts of the only sustained Hawaiian sojourn of Captain Cook's last expedition (1779), augmented by decades of subsequent accounts of Hawaiian scholars, resident farmers, and visitors. Analyses of archaeological evidence of the eighteenth century intensification of the Kona Field System and traditional evidence of the coeval emergence of the Hawai'i Island primary state offer the opportunity to test hypotheses linking the two processes.

Homsey, Lara [284] see Roe, Lori

Homsey, Lara (Murray State University)

[284] *Microartifact Analysis of a Mississippian House Floor at Wickliffe Mounds, Kentucky*

This paper reports on microartifact analyses from a partial Mississippian pithouse interior at Wickliffe Mounds (15Ba4) located in Ballard County, western Kentucky (ca. AD 1100-1350). Distributions of microartifacts in the 1-2mm and 2-4mm fractions are compared to those of macroartifacts in the 6.3-12.5mm ($\frac{1}{4}$ " - $\frac{1}{2}$ ") and 12.5-25mm ($\frac{1}{2}"$ - 1") fractions. Preliminary results indicate that the smaller fractions do not simply mirror the macroartifact assemblage, but rather contain additional information about cultural behaviors in Mississippian homes. Density plots of microartifacts reveal the intensity and location of human activities within the household including distinct areas for cooking/food preparation; tool maintenance; and the storage of ceramics, shell, & copper materials. These distributions clearly differentiate between public and private areas, a result conforming to idealized models of household organization postulated for Dallas-phase Mississippian sites in Tennessee. Finally, the identification of copper is particularly noteworthy since only two slivers were recovered during excavations. The copper microartifacts, found only in the 1-2mm fraction, appear to be malachite—a copper ore—rather than native copper. These remains may represent materials ground to make green pigments, an activity not readily apparent in the macroartifact assemblage.

[284] *Chair*

Hood, Angela [210] see Lentz, David

Hoogland, Menno [106] see Mol, Angus

Hoogland, Menno (Leiden University), Hayley Mickleburgh (Faculty of Archaeology, Leiden University) and Anne van Duijvenbode (Faculty of Archaeology, Leiden University)

[254] *Mortuary and Bioarchaeological Expressions of Identity: Spatial and Chronological Variation throughout the Ceramic Age in the Caribbean Archipelago*

During the previous two decades the Caribbean Research Group at Leiden University (The Netherlands) has developed a unique multidisciplinary approach to the study of mortuary practices and bioarchaeological expressions of identity of Amerindian communities in the insular Caribbean. Evidence from bioarchaeological, archaeological, ethnohistoric and ethnographic research is combined to investigate foodways, health and disease, kinship, mobility and migration, and mortuary practices. This paper focuses on spatial and chronological variation in mortuary behavior, dietary habits, crafting, and intentional bodily modifications in the Ceramic Age Caribbean archipelago. The archaeothanatological study follows Henri Duday and focuses on the reconstruction of the ritual context in which burial data are

created. Dental wear and pathology reveal distinct differences in foodways and the use of the teeth as tools in craft activities over space and time. The signaling function of the altered head shapes makes this practice of permanent bodily alteration ideally suited to the study of identity. These three distinct lines of evidence will further expand our understanding of identity among the Amerindian communities of the Caribbean archipelago in prehistoric and early colonial times.

Hopkins, Maren (Anthropological Research, L.L.C.), Saul L. Hedquist (University of Arizona), Stewart B. Koyiyumptewa (Hopi Cultural Preservation Office), Lee Wayne Lomayestewa (Hopi Cultural Preservation Office) and T. J. Ferguson (University of Arizona)

[67] *Tungwniwi nit Wukwlavayi (Named Places and Oral Traditions): Multi-Vocal Approaches to Hopi Land*

Hopi culture integrates varied understandings of Hopitutskwa ("Hopi land") and its history. Lived experience, gender, and village, clan, and society membership all shape unique connections to different components of the Hopitutskwa landscape. This is exemplified through the myriad ways Hopis remember, interact with, and honor their land. In this paper we focus on two interrelated sources of variability: 1) the oral traditions of different clans; and 2) knowledge of, and experience with named places on the landscape. Both underscore Hopitutskwa as a dynamic amalgam of personal experiences and history. Following the work of Leigh J. Kuwanwisiwma, we advocate a collaborative, multi-vocal approach to Hopi scholarship. We bridge Hopi and non-Indian approaches to landscape in an attempt to document Hopi knowledge of place and history within a format both true to Hopi epistemologies and accessible to a variety of audiences. Documenting Hopi oral traditions and toponyms carries wide-ranging benefits, foremost of which is the preservation of historical and place-related knowledge for future generations to behold—*itam hapi naap itàa sinmuy nit tsaaatsakwmuy amungem it naavotit nàasasalwa*. Such work may also inform targeted studies of cultural affiliation and traditional land use, thus facilitating the implementation of culturally sensitive land management strategies.

Hoppa, Kristin (University of California, Santa Barbara)

[103] *Middle Holocene Plant Use on Santa Cruz Island*

Within the Santa Barbara Channel region, current understanding of the prehistoric use of terrestrial resources is largely based on indirect evidence, including ethnobotanical information and the presence of artifacts associated with food processing. Direct evidence can be found in macrobotanical remains (e.g., charred seeds), and microbotanical remains (both starch grains and phytoliths) extracted from the surface of ground stone artifacts. While certain resources (e.g., nuts and seeds) are likely to preserve as carbonized macrobotanicals, others (e.g., grasses, roots, tubers) are more likely to be recovered through microbotanical analysis. Using a combined approach therefore allows for the recovery of a wider range of plant taxa and a fuller understanding of the prehistoric diet. The analysis of groundstone residue can also provide direct evidence for tool use and processing techniques. The current study incorporates archaeobotanical data from four middle Holocene (6,650 to 3,350 cal BP) sites on Santa Cruz Island to understand the role of terrestrial resources at this time.

Hopt, Justin (Washington State University) and Colin Grier (Washington State University)

[88] *Subsistence and Resource Use at a Late Period Plankhouse Site at the Dionisio Point Locality (Site DgRv-006), Galiano Island B.C.*

The economic organization of households and villages has been a recurrent subject of investigation in the Salish Sea. This study examines the composition of a shell midden adjacent to a Late-period plankhouse (site DgRv-006) at the Dionisio Point locality on Galiano Island in southwestern coastal British Columbia. Shell

middens are a conglomerate of the leftovers of resource acquisition and other subsistence activities undertaken from the site, and so provide a wealth of data about the local economy. Here, faunal material recovered from the midden and bulk matrix samples provide data for reconstructing the catchment zone and coastal microenvironments exploited to support a large plankhouse household. These results are discussed in relation to other Late period village sites and overall trajectories of economic change advanced for the region.

Horn, Peter [17] see Schaaf, Peter

Horn, Sherman (Tulane University), Terry Powis (Kennesaw State University) and Jaime Awe (Institute of Archaeology, Belize)

[171] *It Takes More than a Village: Households, Socioeconomic Networks, and Social Development in the Middle Preclassic Belize Valley*

The Middle Preclassic (900 – 300 BC) in the Southern Maya Lowlands remains a poorly understood time period despite intensified research over the past three decades. The construction of large public buildings at some sites stands in stark contrast to the modest domestic architecture of others, but a trajectory of increasingly complex village societies is generally accepted for this time. Explanatory models for the rise of complexity vary, but most emphasize either site-specific internal processes, or external processes focused on the acquisition of exotic trade goods. In this paper we argue that neither of these perspectives is sufficient in itself; and that to understand the development of social complexity, we must account for processes operating at both the local and regional scales that link households, and communities, to each other in complex socioeconomic networks. Such networks are fundamental to the formation and maintenance of identity, and their material residues offer clues to changes in the social roles of persons and households during this time of increasing complexity. Data from the Belize Valley sites of Cahal Pech and Pacbitun demonstrate new insights that can be gained from a multiple material categories approach to understanding how social differentiation among households is expressed.

Horn III, Sherman [24] see Howie, Linda

Horton, Beth (Washington State University, National Park Service)

[92] *Officers, Soldiers, and Laundresses: A Study of Status, Space, and Interaction at Mid-Nineteenth-Century Vancouver Barracks, Fort Vancouver National Historic Site, Washington*

The U.S. Army's Vancouver Barracks in southwest Washington was headquarters for Pacific Northwest military exploration and campaigns in the last half of the nineteenth century. Living onsite in designated quarters were officers and their families, soldiers, and various support workers. Recent National Park Service excavations of residential structures and outbuildings associated with Commissioned Officers, enlisted soldiers and laundresses provide an opportunity to better understand the daily lifeways within military communities in this region. This paper explores the relationship between historically documented use(s) of these spaces and recovered material culture, specifically examining whether recovered artifacts reflect documented socioeconomic status and interaction patterns of occupants during the 19th century. Long-term archaeological and historical research programs at Fort Vancouver National Historic Site provide contextual and comparative information on social use of material culture by other segments of the community.

Horton, Katharine [222] see Glantz, Michelle

Hosoya, Leo (Kyoto University, Dept. Literature)

- [250] *What to Grind? Significance of Grinding Stones in Prehistoric East Asia from Ethnoarchaeological and Experimental Viewpoints*

Grinding stone is one of most versatile prehistoric tools, particularly in food processing. Food processing is a fundamental technique for human subsistence strategy, which is common to hunter-gatherers and farmers, so its reconstruction is necessary to comprehend prehistoric human-environmental interactions. A grinding stone, which is durable and broadly remains in archaeological sites, can be a most useful clue to the study.

Although there is a common view that grinding stones are not such important food processing tools in Eastern Eurasia (cf. Fuller & Rowlands 2009), it has been recognized that wild food processing, particularly nuts, was widely connected with grinding stones in prehistoric East Asia. In Japan, the study has been remarkably developed since 1970s introducing ethnoarchaeological methods. In China also, with recent archaeobotanical discovery that even after introducing agriculture wild nuts exploitation was central in Neolithic subsistence strategy, discussion is raised for reconsideration of functions of Neolithic grinding stones, which had been a priori considered millet dehusking tools and thus underestimated of the importance in south China: the rice cultivation area (Makibayashi 2005).

This paper discusses Chinese early rice farmers' potential uses of grinding stones with nuts and other wild plants based on ethnographic information and newly developed experimental results.

Hotchkiss, Sara [255] see Chadwick, Oliver

Houghten, Holly [281] see Mt. Joy, Kristen

Houk, Brett (Texas Tech University), Gregory Zaro (University of Maine), Brendan Culleton (Pennsylvania State University) and Douglas Kennett (Pennsylvania State University)

- [256] *All Our Yesterdays: Alternative Histories of La Milpa, Belize*

La Milpa, Belize has been a symbol for the accepted historical trajectory of the ancient Maya in northwestern Belize: nucleated Late Preclassic period settlement, modest Early Classic growth, explosive Late Classic expansion, and rapid abandonment at or slightly before the onset of the Terminal Classic period. That view was built on traditional archaeological methods for developing a site-specific chronology, namely plaza test pitting and ceramic cross-dating. Recent excavations by the La Milpa Core Project in the southern plazas at the site, however, have demonstrated that La Milpa's occupational history is both longer and more complicated than previously believed. In this paper, we compare two views of La Milpa's occupational history: the first results from traditional approaches to chronology building, and the second chronology results from combining test pit data, architectural excavations, extensive and careful study of surface artifact deposits, and detailed stratigraphic and AMS 14C work. As we demonstrate, the two approaches result in very different tales for the history of one city, and we caution against the overreliance on a single line of evidence for chronology building.

Houlette, Christopher [168] see Carter, Fawn

Hovers, Erella (The Hebrew University of Jerusalem) and René Bobe (George Washington University)

- [28] *Was Oldowan Lithic Technology Responsive to Environmental Change?*

The emergence of stone tool technology has been perceived as a novel behavioral adaptation of hominins to changes in climate and ecological conditions, yet the Oldowan has been hypothesized to

be a million year-long period of technological stasis despite environmental changes on both global and local scales. Here we review technological trends in the eastern African Oldowan archaeological record and relevant faunal databases in order to test this hypothesis. We compare faunal abundance data from early Oldowan localities at Hadar, Ethiopia, with contemporaneous faunas from the Kalochoro Member of the Nachukui Formation (West Turkana, Kenya), and from later Oldowan sites in Kaitio Member localities at West Turkana with KBS Member localities at Koobi Fora. The faunal data imply expansion of grassland habitats over time, and contrast local with regional environments during the time of the Oldowan. As a core-and-flake techno-complex, the Oldowan shows little temporal change in lithic morphotypes, yet the organization of activities related to procurement, curation and use of lithic raw material changes from the earlier to later Oldowan. We examine the association of behavioral changes with the documented ecological shifts and consider causal explanations of the observed patterns.

Howard, Steven

- [54] *Middle Woodland in the Upper Allegheny Valley*

From around 2100 to 1600 years ago, the people who lived in the upper Allegheny Valley in northwestern Pennsylvania and western New York were participating in a widely-spread mortuary tradition in which some of their dead were interred in burial mounds. The tradition is exemplified in the Ohio Hopewell to the southwest, and some aspects of Ohio Hopewell mortuary behavior were borrowed by the local population, through apparently limited contact via the Ohio-Allegheny River. Burial sites from the period have been recorded in varying degrees of completeness from the 1820s through the 1960s. For the current study, a total of thirty-eight mound records have been evaluated from the area to provide a detailed, localized account of mortuary and social behavior. Results suggest that the Allegheny Valley population were small hunter-gatherer groups that adapted certain mortuary behaviors from Ohio Hopewell to their local ideological traditions, some aspects of which may have been shared with Ohio Hopewell through common ancestral traditions. While these people shared some mortuary characteristics with the contemporaneous neighboring groups known as Point Peninsula and Squawkie Hill, mound construction and burial practices suggest that neither of these constructs adequately characterizes the sites found in the Allegheny Valley.

Howe, Mark (US State Department - USIBWC)

- [276] *Drought along the Rio Grande Border: Falcon Reservoir and the Last 60 Years*

The Rio Grande River is the International border between the United States and Mexico which also defines the southern border of Texas and northern border of several Mexican states. The Treaty of February 3, 1944 authorized construction of dams by the United States Section, International Boundary and Water Commission (USIBWC) and its Mexican counterpart, including Falcon Dam in the 1950's. These reservoirs were designed for flood control and irrigation projects along the Rio Grande Valley, and to alleviate seasonal flooding from worsening because of increased settlement. When Falcon Dam was completed, local towns and homesteads on both sides of the border were displaced. The US Government, through the USIBWC, moved and reinterred 21 cemeteries on the American side to higher ground, marked above the "307 line." Some cemeteries were never completely moved due to family concerns and other reasons. These cemeteries are now being exposed as the reservoir is lowering from drought and other conditions. Prehistoric and other historic burials, sites, structures and artifacts are now being exposed. This paper will discuss what is happening to the area archaeology and history because of the lingering drought, USIBWC mitigation plans and analysis of new and old sites exposed on USIBWC lands.

- [276] *Chair*

Howell, Wayne [137] see Crowell, Aron

Howey, Meghan (University of New Hampshire)

- [24] *Impossible but Everyday Affairs in the Borderlands of the Upper Great Lakes, 1200-1600*

Late Precontact in the upper Great Lakes (ca. A.D. 1200 – 1600) was marked by the rise of specialized economies based in part on the spread of maize horticulture. Lake-effect along the coasts of the Great Lakes extended the growing season such that maize cultivation was feasible in coastal areas but not inland. As groups living on the coasts adopted horticulture economies, the upper Great Lakes saw the rise, for the first time, of heightened territoriality. A material and conceptual borderland emerged between coastal horticulturalists and inland foragers. This paper argues that in this setting of increasing socio-economic difference, Late Precontact indigenous communities faced what Taussig (1993) has called an impossible but necessary, indeed everyday affair; the need to register both sameness and difference, to be like and be Other. Creating stability from the instability of social alterity in borderlands is no small task. This paper explores the ways communities developed multiple and contrasting strategies for encountering, exploring, and negotiating difference, and ultimately, finding ways to yield into it. This case illuminates the ways borderlands create impossible but everyday affairs for the people living in them of habitually having to find ways of being both identical and alter.

Howie, Linda (The University of Western Ontario) and Sherman Horn III (Tulane University)

- [24] *The Same Thing Only Different: Maya Identity Construction in the Eastern Lowland "Borderlands"*

The cities of the eastern Maya Lowlands are often assigned a peripheral role in regional models of sociopolitical and economic organization and interaction. Situated in the borderlands between the historically recognized spheres of power and influence centered in the Northern and Southern Lowlands, scholars frequently view the developmental trajectories of communities in Belize as passive responses to processes originating in one or the other of these “core” areas. Archaeologists point to differences in the material manifestations of elite culture and levels of community wealth as evidence for these inferences, but material indices are significantly biased toward large sites that were excavated early on in the history of Maya archaeology. Processes involving the creation, negotiation, and maintenance of new forms of social identity are critical to understand when studying social change; however, when looking at areas outside of the traditional “cores” of Maya society, archaeologists may miss the significance of material variability in understanding the contextual contingency of identity construction. We argue that pervading interpretation of variation in the material expression of a “Maya” identity, shaped significantly by excavation history, ignores community self-determination and the active role of local networks of affiliation and interaction, especially during key periods of cultural transition.

Hritz, Carrie (The Pennsylvania State Un)

- [245] *Discussant*

Hu, Di (University of California, Berkeley)

- [277] *Changes in the Materiality of Language, Landscape, and Lithics in the Andes from the Colonial Era to the Present*

Early paradigms of Andean culture change emphasized continuity and the timelessness of the ethnographic present. More recently, while historians have realized that profound changes occurred from the late pre-Hispanic period to the present in the native Andes, the common themes in the changes in the materiality of

language, landscape, and lithics in the colonial Andes have been understudied from an archaeological point of view. In this paper, I will outline some of the major changes in the materiality of Quechua, of the relationship between landscape and architecture, and of the use of lithics from the early colonial period to the present. The main focus will be of case studies from central and south-central Peru.

Huang, Ada L. [96] see Blackwell, Bonnie A.B.

Huard, Aimee

- [272] *Mortuary Patterns and Biodistance as an Interpretation of Use of Space at Cerro Mangote (7000-5000 B.P.), Panama*

The archaeological evidence at Cerro Mangote suggests the Preceramic site was used as both a mortuary and resource collection site. This paper presents the use of space through mortuary treatments, biological profiles (age, sex, paleopathology, trauma, biometrics), and biodistance. The prior excavations uncovered haphazardly constructed stone piles spread throughout the site, appearing to designate three separate areas of burial groupings. The intracemetery relationships were assessed using these three groupings. Biodistance based on dental metrics was used to assess familial groups based on biological affinity. The biological profiles indicate specialized treatment of juvenile burials through burial position, treatment, and artifacts. Principal components analyses (PCA) of the biometrics of the three groupings indicate the first two components (PC1, PC2) signify tooth size (PC1) and tooth type (PC2). These two components explain 52% of the variance when corrected for size (eigenvalues: PC1=4.265, PC2= 3.039). The PCA indicates no distinct patterns among the three groups, with approximately 50% of the individuals from each group overlapping, indicating there is no separation at the cemetery based on the a priori groupings. The results highlight the experimentation in mortuary patterns by the living population, illustrating variation not typically assumed in a Preceramic site.

Hubbard, Emily (University of Toronto)

- [183] *Chalcolithic Use of Dung as Fuel: Evidence from Tel Tsaf, Israel*

It is accepted that secondary animal product use was practiced in the Near East following domestication. By the Chalcolithic Period (c. 5200-3600 BC) in the Southern Levant, it is assumed animals were exploited for dairy products, wool and traction. Faunal analysis and residue analysis have been used to help provide evidence for these uses, with. Most discussions of second product use, however, overlook dung. It has multiple uses, including fuel, fertilizer and as a building material. During excavations at the Chalcolithic site of Tel Tsaf, Israel (5200-4600 BC) sediment samples were taken from a number of roasting pits located in a residential courtyard. The results of microscopic analysis presented phytolith and dung spherulite data indicating that the inhabitants at Tel Tsaf were utilizing dung as a secondary product to fuel the ovens. Similar evidence has previously been identified by other researchers at the Chalcolithic site of Grar, Israel (Gilead et al 2007). The data from Tel Tsaf contributes to the discussion of secondary product exploitation in the region.

Hubbe, Mark (The Ohio State University) and Christina Torres-Rouff (University of California, Merced)

- [38] *The Relationship between Burial Offerings and Aspects of Diet, Social Identity, and Violence in Northern Chile's Atacama Oases*

During the Middle Horizon (A.D. 500-1000), the San Pedro de Atacama oases were inserted with the socio-political network structured around the Tiwanaku polity. Many cemeteries from this period show individuals buried with objects in Tiwanaku style, as well as goods from other neighboring regions. Here, we test whether the presence of foreign goods in five cemeteries is associated with biocultural aspects of individual lifestyle. We analyzed the prevalence of caries, cranial vault modification, and

cranial trauma, as a way to assess aspects of diet, social identity, and violence in individuals whose graves associated them with Tiwanaku, with other foreign groups or only with the local community. Our results show that the presence of foreign objects is related to a lower prevalence of caries, while no difference is observed in the prevalence of cranial modification or trauma. There are differences in the prevalence of these two indicators between sites, however. We conclude that a closer association with foreign cultures is an indicator of increased access to protein resources, whereas susceptibility to violence and head shaping patterns appear to be associated with local factors. This assessment suggests that individuals with access to these distant resources may have benefited from interregional exchange networks.

Hubbe, Mark [217] see Pestle, William

Hublin, Jean-Jacques [38] see Fahy, Geraldine E.

Hudson, Jean (U Wisconsin- Milwaukee)

[151] *Valuable Animals: Perspectives from the Peruvian Coast*
Two patterns are explored in the associations of ecological and symbolic meanings of particular animals in the prehistory of the Peruvian coast. First is the apparent shift of key large taxa, such as sea lion and deer, from high ranking subsistence resources to major icons of elite status and spiritual sacrifice. The second is the enduring reference in both food and non-food contexts to particular taxa, such as marine birds, whose behaviors communicate important ecological information about the distribution of key natural resources. The paper explores methods to tease apart these intertwined human perspectives on valuable animals.

[151] *Chair*

Hudson, Nicholas [176] see Littman, Robert

Hudson, Erin (U.S. Army Corps of Engineers), Brian Schnick (U.S. Army Corps of Engineers, Walla Walla District), Alice Roberts (U.S. Army Corps of Engineers, Walla Walla District) and Leah Bonstead (U.S. Army Corps of Engineers, Walla Walla District)

[206] *Archaeological Predictive Modeling along the Lower Snake River, Washington*
This poster presents a Geographic Information System (GIS) predictive model that was developed to identify areas where archaeological sites are most at risk along a portion of the lower Snake River, Washington. The Federal Columbia River Power System (FCRPS) Cultural Resource Program is tasked with the inventory, evaluation, and treatment of historic properties affected by the ongoing operations and maintenance of a series of hydropower dams. After completing numerous archaeological surveys, the Walla Walla District of the Corps of Engineers is required to determine National Register of Historic Places eligibility for hundreds of archaeological sites. Corps archaeologists concluded that the first priority for evaluation should be those sites most likely impacted by the maintenance and operation of the dams. Archaeologists partnered with Corps GIS specialists to develop a raster-based predictive model that identifies areas where historic properties are most likely to be impacted. Nine criteria were identified that could lead to impacts to historic properties. After the model was completed, a random sample of sites was selected for condition monitoring. The information gathered during monitoring was then compared to the GIS predictive model to determine whether the projected risk accurately predicted the impacts identified at the sites.

Huebert, Jennifer (University of Auckland)

[5] *Forest Transformations and Arboreal Subsistence Strategies in Highly Variable Environments: Marquesas Islands, French Polynesia*

Polynesian settlers transformed native forests of the central Pacific islands into productive economic landscapes. Though many of these forests continue to be useful today, some were considerably reduced or have entirely disappeared since western contact, as in the case of the Marquesas Islands. In areas such as this, little is known about the long-term processes of forest change that occurred after human settlement. Wood charcoal analysis is uniquely suited to provide direct information on past vegetation and on human use of arboreal resources. This case study utilises archaeological charcoal assemblages from the island of Nuku Hiva to assess forest changes over time in a high-variance environmental setting. Material from three valleys with contrasting geographic and micro-climate conditions, spanning an 800 year period, are compared. This research contributes to our understanding of the dynamic relationships that exist between social systems, environment and climate in the tropical Pacific islands.

Huff, Jennifer (University of Washington)

[7] *Revisiting Highland New Guinea: New Insights into the Pleistocene and Holocene Occupations of Highland PNG*

This poster will present results of reduction-based lithic analysis of several previously-excavated sites from the highlands of PNG. Combined with the the results of new radiocarbon dating, this analysis will explore the antiquity of occupation for sites close to the Norikori Swamp and patterns of mobility as revealed by variability in lithic reduction in relation to climate-driven and anthropogenic landscape change.

[232] *Moderator*

Huffer, Damien (Australian National University)

[7] *I'm a Stranger Here Myself: Kinship and Community Organization during the Mid-Holocene in Northern Vietnam*

The sites of Man Bac (ca. 3,800 B.P.) and Con Co Ngu (ca. 5,600 B.P.) represent the largest and best preserved skeletal assemblages spanning the transition to agriculture in northern Vietnam. While archaeological data have suggested that long-distance trade and cultural diversity increased and incipient agriculturalists entered the region from southern China and (in the case of Man Bac) interbred with hunter-gatherers from nearby communities, questions remain as to how larger changes to population structure in the region affected social structure at the community level. As part of larger doctoral work, this study investigated genetic kinship (using cranial and dental nonmetric trait analysis) and individual migration histories (using strontium isotopic analysis of enamel and preliminary background sampling) between both populations. Results show that both communities were likely comprised of several small lineages, and that each contained a relatively small number of migrants. In the case of Man Bac, all were adult males and several received high status burials

Huffman, Thomas (University of the Witwatersrand)

[61] *Ritual Space in the Zimbabwe Culture*

The Zimbabwe culture embraces state-level societies dating to the Iron Age of southern Africa (A.D. 1250-1820). In contrast to preceding chiefdoms, ritual space in the Zimbabwe culture centered on sacred leadership. What had been rain-control hills in the wild bush became the locus for stone-walled palaces inside the capitals. Thus, Zimbabwe people 'domesticated' the concept of God. Among other palace functions, the front provided the leader

with ritual seclusion, while the back was reserved for national rituals such as rainmaking. A year after death, royal leaders (both men and women) were buried in the palace or in rock shelters on special hills. Such hilltop burials began in the 13th century at Mapungubwe. According to 16th century documents, both these grave sites and palaces had the same name: madzimbabwe. Royal and commoner youths attended a pre-marital school together that inculcated societal norms. Evidence for such a school first appears in the Mapungubwe landscape. Overall, sacred leadership provided the ideological foundation for institutionalized social classes. Different settlement organizations made these social classes manifest: the Central Cattle Pattern for commoners and the Zimbabwe Pattern for royalty.

Hughes, Randall [124] see Wisseman, Sarah

Hughes, Richard

[279] Obsidian Studies in California

Obsidian studies began in California in the middle 1960's with work devoted to chemical characterization of archaeologically significant volcanic gasses from several of the major eruptive centers in the state. Since then, research has continued to add to, and refine, previous chemical identifications and archaeologists employing obsidian data have become more explicitly aware of the interpretive differences attending views of obsidian "sources" as geochemical vs. spatial entities. I will briefly review the history of obsidian characterization studies in the state, provide examples of some of the ways such data are being used in current archaeological work, then touch on a more general problem facing all researchers employing obsidian provenance data--distinguishing between direct and indirect access.

Hughes , Philip [224] see Barham, Anthony

Huidobro, Consuelo [26] see Morello Repetto, Flavia

Hulit, Elissa (CCRG, Inc.)

[25] A Statistical Model for Compositional Analysis and Clay Sourcing Using the Portable X-Ray Fluorescence Device for Analysis of Prehistoric Ceramics.

The Bruker Tracer IIv+ portable X-ray fluorescence analyzer (pXRF) provides a non-destructive method of examining the elemental composition of prehistoric ceramics. This elemental data can provide insight into local resource utilization, trade patterns, and technological variability. However, in order to take full advantage of this data, the compositional readings produced by the device must be statistically analyzed to determine whether noted patterns are significant. Compositional data presents challenges in the use of traditional statistical methods and robust calculations of outliers and data partitioning are required. This paper outlines an appropriate procedure which uses the isometric log-ratio transformation prior to the use of principal components analysis for the practical study of clay sourcing in Southeastern Wisconsin and suggests modifications for the direct applications of this procedure to the analysis of prehistoric ceramics.

Hull, Kathleen (University of California, Merced)

[241] Ritual as Performance in Small-Scale Societies

Although archaeological study of ritual as performance has garnered increasing attention in recent years, such research has primarily focused on large-scale, complex societies and, therefore, the relation of performance to politics and power. In contrast, this paper explores archaeological assessment of public performance within small-scale societies, considering especially the significance of specific practices to social integration, identity, and historicity.

This analysis is informed by emerging interdisciplinary theory on ritual, dramatization, and performance, and draws on archaeological evidence of cyclic communal mourning rites in coastal southern California that reveal aspects of performance including item manufacture, burning, pigmentation, sequential fragmentation, and structured deposition in "persistent places."

Hull, Sharon [252] see Mathien, Frances

Hull, Sharon (University of Manitoba), Timothy D. Maxwell (Museum of New Mexico, Office of Archaeological Studies), Mostafa Fayek (Department of Geological Sciences, University of Manitoba) and Rafael Cruz Antillón (Instituto Nacional de Antropología e Historia)

[252] Chasing Beauty: Evidence for Southwestern U.S. Turquoise in Mexico

Using a new approach to identify the geological provenance regions of turquoise artifacts using the isotope ratios of hydrogen and copper and the microanalytical abilities of a secondary ion mass spectrometer (SIMS), we analyzed a suite of turquoise artifacts from the Casas Grandes region of northern Mexico and compared the data to our reference database of hydrogen and copper isotopic ratios of turquoise resource areas. The turquoise samples came from sites in the Casas Grandes region of Chihuahua dating to the latter half of the thirteenth century. The sites show evidence for the production of ornaments. Our results identified turquoise deposits in Colorado and New Mexico for the origins of the turquoise pieces.

Humkey, Kayce [284] see Homsey, Lara

Humphrey, Emma (University of Toronto)

[162] Eating in the Kebaran: Intersite Variability in Prey Exploitation during the Early Levantine Epipaleolithic

Recent research on hunter-gatherer resource exploitation strategies of the Levantine Epipaleolithic (approximately 20,000-10,000 years B.P.) has focused primarily on behavioral adaptations associated with the Natufian. While this research has important implications for the development of agriculture and animal domestication for the early Neolithic, it has had the unintended result of drawing attention away from the early Epipaleolithic. As a result, the impression that has been created is that Kebaran subsistence behavior is monolithic in nature – regardless of location, hunter-gatherers focused on a limited number of similar species, with little-to-no-evidence of specialization or variability in prey choice. This present research explores the nature of Kebaran prey exploitation strategies. Assemblages from the Jordan Valley are compared to assemblages from the Mediterranean Coastal Plain. Through a discussion of the differences in prey diversity (prey distribution and prey breadth), and prey rank (small ungulate exploitation and small prey exploitation) among assemblages, it will be shown that Kebaran subsistence behavior is highly variable and complex.

Hung, Hsiao-chun (Australian National University)

[216] The Emergence of Metal Age in Taiwan and Its Relation with Southeast Asia

This paper will discuss the origin of Metal Age technologies in Taiwan and the related trade networks between Taiwan and Southeast Asia. The geographic location of Taiwan is much closer to Coastal Southeast China, but Mainland Southeast Asia was the primary connection for iron and bronze technologies, glass beads, carnelian/agate beads, and other materials coming to Taiwan, ca. 300 BC. When those foreign goods entered Taiwan, the trade routes were built over other networks for exporting Taiwan nephrite broadly throughout both Mainland and Island Southeast Asia, such as in the Philippines, Eastern Malaysia, southern Vietnam and southern Thailand. This so called "Jade trail" from Taiwan to Southeast Asia likely played a significant role on the

developments of the Metal Age in Taiwan prehistory.

Hung, Ling-yu (Indiana University) and Jianfeng Cui (Peking University)

[249] *Development of Neolithic Potting in the Eastern Tibetan Plateau*

In the eastern Tibetan Plateau, the earliest pottery remains indicate strong cultural and technical connections with the Yangshao and Majiayao potting traditions based on the Western Loess Plateau. Before the arrival of Yangshao/Majiayao potters and farmers, indigenous hunter-gatherer groups living in the eastern Tibetan Plateau showed no evidence of technology for potting. The development of Neolithic potting in this region could have involved dynamic interactions among different indigenous groups and immigrant groups moving to this region across thousands of years, as well as new human-environmental interactions. Based on recent archaeological findings and physicochemical analysis of diagnostic potsherds selected from multiple sites, new information helps to conceptualize how diverse processes—human migration, technical transmission, style imitation, and pottery importation—operated in the development of Neolithic potting in the eastern Tibetan Plateau.

Hunt, Terry (University of Hawai'i) and Carl Lipo (California State University Long Beach)

[167] *The Remoteness of Rapa Nui*

Rapa Nui (Easter Island) is among the world's most remote inhabited places. Its remoteness with other unique factors meant the prehistoric islanders lacked mobility, remaining remarkably isolated. Isolation constrained solutions to problems of resource competition, population, and risk reduction. In this paper we examine bet-hedging, including aspects of cultural elaboration, community organization, and human biology that sustained the prehistoric population.

Hunter, Ryan

[81] *Coastal Connections and Reservation Contexts: Eastern Pequot Use of Shells*

This paper addresses the use of shellfish by the Eastern Pequot during the eighteenth and nineteenth century based on excavation of middens on their reservation in southern Connecticut. These shells are considered as part of foodways, as part of continued traditional practices, and as evidence of the realities of off-reservation movement and restrictions on land access. Given the long history of shellfish use by Native communities in southern New England, continued consumption of shellfish provided a valuable tie to the past and reinforced social networks in the eighteenth and nineteenth centuries. Off-reservation Native communities provided a potential link between inland reservations and culturally valuable resources, while collecting shellfish served as an opportunity to remain connected to longstanding food resources. Moreover, links between women and shellfish gathering provide insight into how gender imbalances of reservation populations influenced visible activities and suggest how certain practices changed or stayed the same. Since sites on the Eastern Pequot reservation record traces of everyday life amidst certain colonial pressures, I consider what shells - as one specific aspect of daily life - can tell us about much larger issues of Eastern Pequot life during the eighteenth and nineteenth centuries.

Hunter-Anderson, Rosalind (University of New Mexico)

[244] *Niche Dynamics in Late-Holocene ISEA and the Mariana Islands, Micronesia*

Recent archaeological research at the earliest sites in the Marianas raises more questions than answers regarding the causes and character of human advent in this remote archipelago. These small, exclusively coastal sites date ca. 3500-3000 ybp (the Early Unai Period, EUP), contain no evidence for agriculture or

permanent occupation; faunal remains indicate a generalized marine subsistence orientation. The numerous marine shell ornaments, of varying stages of manufacture, and the delicately decorated redware pottery from small vessels evidently not for cooking, are puzzling: such indications of complex sociality would be superfluous among low-density pioneering groups. These early assemblages challenge models of Pacific settlement that posit "population pressure" among agriculturalists in Island Southeast Asia (ISEA) motivated initial human forays into Remote Oceania. I present an alternative model that proposes the EUP folk were not settlers, but transients occupying a sea-trader niche in ISEA. Their part-time use of the Marianas represents a range expansion tactic, allowing access to uncontested natural resources with which to remain in that niche while competitive conditions intensified during the late Holocene. The model's goodness-of-fit is evaluated with archaeological and paleoenvironmental data, and test implications are derived.

[95]

Discussant

Huntington, Fred [130] see Prasciunas, Mary

Huntley, Deborah (Archaeology Southwest) and Jeffery Clark (Archaeology Southwest)

[110] *Preservation Archaeology in the Southern Southwest: Minimizing Impact, Maximizing Results*

For more than two decades, Archaeology Southwest (formerly the Center for Desert Archaeology), has practiced Preservation Archaeology in the southern U.S. Southwest. Our mantra has been "less is more," limiting site impacts by using targeted excavation, survey, and mapping to answer specific research questions. Big picture research has been conducted by (re)analyzing existing collections using new techniques and organizing large, eclectic bodies of archaeological knowledge into systematic databases in multi-institutional collaborations. Local outreach, student and public education, and long-term site protection have been closely integrated with research efforts. Our research program has been organized around two themes: late precontact demographic decline and ancestral Puebloan (especially Kayenta) immigration. This program was initiated in the San Pedro Valley of southeastern Arizona. We subsequently expanded our research scope, examining Kayenta immigration and Salado coalescence/hybridization in adjacent valleys and basins. Over the past five years, interest in the disproportionately high influence of small and dispersed Kayenta groups brought us to the Upper Gila and Mimbres Valley of southwestern New Mexico. In the near future, we will take a new research direction and study late precontact communities in southern Arizona that resisted Kayenta immigration and the inclusive Salado ideology.

Huntley, Deborah [139] see Ownby, Mary

Hurst, Heather (Skidmore College) and Franco Rossi (Boston University)

[21] *Making Art: Defining Artist Practice and Organization at Xultun, Guatemala*

Beyond visual creativity, the role of the artist-scribe in Classic period Maya culture was one of specialized knowledge, literacy, and politics. Artist signatures and titles, iconography of patron deities, and the material record inform our understanding of artists' roles. The recent discovery of mural paintings within a residential complex at Xultun, Guatemala presents new data regarding artistic practice among Late Classic period artist-scribes. This paper examines the Xultun archaeological assemblage in conjunction with iconographic and material analysis to characterize these artists' working practice and internal organization. Artworks and writing materialized religious and political beliefs, placing the artists at the heart of sociopolitical activity. The artistic practice at Xultun helps define the social reality of this early 9th century

lowland city and considers the artists' role in creating instruments of power, conditions of patronage, and the exchange of ideas in Classic Maya culture.

Hurst, Winston (Bohunk Inc.), Steven J. Manning (Independent researcher), Jay Willian (PaleoWest) and Benjamin A. Bellorado (University of Arizona)

[51] *Ghost Images of What? Depatinated Ovoids and Ritual Plant Processing in the Ancient Puebloan Southwest*

Patterned arrays of ghostly shapes termed "hypopatinated ovoids" (HPOs) found on patinated rock faces in the lower San Juan River drainage are subtle, frequently overlooked, and have been minimally investigated. Available data on their distribution, combined with replication experimentation, suggests (1) a likely Basketmaker-early Pueblo association; (2) a distribution roughly centered on the Comb Ridge area of southeastern Utah; and (3) a possible causative process involving the boiling and drying of plant leaves containing oxalic acid for ritual and/or food storage purposes. We present the results of replication experiments and suggest that the ancient patterned ovoids offer important and largely ignored clues into ancient Puebloan ritual and food storage technology.

Hurst, Heather [290] see Thibodeau, Megan

Huster, Angela (Arizona State University)

[229] *Of Comales, Cotton, and Aztec Orangeware: The Effects of Aztec Conquest at Calixtlahuaca*

The ethnohistoric record suggests that the 1478 Aztec conquest of Calixtlahuaca and the surrounding Toluca Valley resulted in large-scale political reorganization and population movement. This paper uses domestic ceramic assemblages from 19 Middle and Late Postclassic excavated household components at Calixtlahuaca to examine how these changes were felt at the household level. In particular, I examine changes in trade networks using INAA and ceramic type distributions. I look at vessel form frequencies and production attributes to address the issue of migration. Overall trends show widespread changes in both trade patterns and the diversity of vessel assemblages following the Aztec conquest of the site.

[229] *Chair*

Hutchings, Karl (Thompson Rivers University)

[98] *A Moment in Time Set in Stone: Identification and Analysis of Velocity-Dependent Lithic Micro-Fracture Features*

When a force sufficient to rupture atomic bonds is applied to stone it creates a fracture. As the fracture progresses through the stone, the moving crack front interacts with inclusions and boundaries in the stone resulting in the production of specific micro-topographic fracture features that record the relative orientations of the crack front and the (secondarily generated) distortional wave produced by the interaction. These micro-fracture features are observable on fracture surfaces of stone implements, and can be employed to determine the velocity of the original fracture. Prior controlled experimentation has shown specific ranges of fracture velocities are associated with various manufacturing and use activities (including weapon impact), thereby providing archaeologists with a valuable, non-subjective tool for identifying the cause of a given fracture, and contributing to our knowledge of past human and hominin behavior. Despite the complexity of the underlying mechanics of brittle fracture, the recovery of fracture velocity data is relatively straight-forward. Accurate data are dependent on accurate identification and measurement of velocity dependent micro-topographic fracture features. With the intent of encouraging others to evaluate and adopt the methodology, the author discusses the nature of these microscopic features, equipment requirements, procedures, and various challenges and solutions related to identification and analysis.

Hutchings, Karl [98] see Pargeter, Justin

Huynh, Hanna [149] see Ames, Nicholas

Hyde, David M. (Western State Colorado University)

[127] *Rural Power and Gender: The View from Medicinal Trail, a Late Preclassic Maya Hinterland Community in Northwestern Belize*

Prehispanic Maya commoners were once seen as simple, homogenous, and powerless.

Recent work in the hinterland settlements of the Maya lowlands has revealed a complex social and political structure within these rural communities.

Women were also viewed as peripheral, forgotten, or ignored in much of the early literature on the Prehispanic Maya. As with commoners, our understanding of the role(s) of women in Ancient Maya society has been expanding. Current research has demonstrated that commoners were far from homogenous, and women were far from peripheral.

Recent excavations in the Late Preclassic components of the Medicinal Trail Community in northwestern Belize have revealed a complex commoner household with local socio-religious power. Additionally, there is evidence suggesting that this power was in the hands of a female member of the household.

This analysis adds to the growing body of research that continues to shed light on the complex nature of ancient Maya commoners, as well as the realization that women in the hinterlands, just like those in the elite urban centers, were important agents in the socio-political structure of the communities in which they lived.

[127] *Discussant*

Hyde, David [235] see Brewer, Jeffrey

Hylkema, Linda [119] see Peelo, Sarah

Iannone, Gyles [65] see Lamoureux St-Hilaire, Maxime

Ibarra Morales , Emilio [234] see Zurita-Noguera, Judith

Ikawa-Smith, Fumiko (McGill University)

[112] *Peopling of the Japanese Archipelago: When? From where? And how many times?*

After the close scrutiny of the artifactual and stratigraphic evidence at the purportedly "Early and Middle Paleolithic" sites that followed the exposure of the "Scandal" in 2000, there remain a handful of assemblages that may indicate relatively early arrivals of humans in the Archipelago. The remainder of some 10,000 Paleolithic assemblages date to the period after 40,000 cal. B.P. Temporal and spatial distribution of the technological characteristics of the assemblages in the Archipelago and on the continent, as well as DNA indications of fossil and living humans in the Asia-Pacific region, suggest to this writer an early arrival of humans via a southern route, followed by migration from, or contacts with Northeast Asia at least three times during the late Pleistocene, resulting in the introduction of the classic blade technique, the composite tools involving microblades, and finally the ceramic utensils that appeared in the Archipelago about 16,000 cal. B.P.

[112] *Chair*

Ikehara-Quebral, Rona (Int'l Archaeological Research Institute, Inc.), Miriam Stark (Department of Anthropology,

University of Hawaii,), William Belcher (Central Identification Laboratory, Joint POW/MIA A), Vouen Vuthy (Ministry of Culture and Fine Arts, Phnom Penh, Cam) and John Krigbaum (Department of Anthropology, University of Florida.)

[190] *Biocultural Practices during the Transition to History at Angkor Borei, Cambodia*

Mainland Southeast Asia underwent dramatic changes after the mid-first millennium B.C.E., as its populations embraced new metallurgical and agricultural technologies. Its physical and social environment was further transformed by the emergence of international maritime trade and political reorganization associated with early state formation. To understand the health impacts of this changing environment, we examined an Early Historic period (200 B.C.E. to 200 C.E.) skeletal sample from Vat Komnou, Angkor Borei, in the Mekong delta of southern Cambodia. Degenerative joint disease patterns indicate a distinct sexual division of labor during this period. Intentional dental filing appears to have contributed to poorer oral-dental health. Dental pathologies suggest that the Vat Komnou inhabitants consumed a mixed diet with more fibrous foods and a lower reliance on soft, processed agricultural foods. Isotopic analyses suggest a relatively greater reliance on fish and estuarine dietary resources than on terrestrial protein. We contextualize the Vat Komnou results by comparing them against contemporaneous bioarchaeological data from Cambodia and Southeast Asia, and incorporate findings from recently completed zooarchaeological analyses to study environmental changes at the local and regional scales in the lower Mekong region.

Illingworth, Jeff [147] see Costa, August

Inglis, Robyn [215] see Bailey, Geoff

Ingram, Scott [273] see Nelson, Margaret

Inomata, Takeshi (University of Arizona)

[4] *Moderator*

[144] *Discussant*

Inomata, Takeshi [171] see Triadan, Daniela

Iovita, Radu [274] see Rolett, Barry

Isabella, Jude (Univesity of Victoria)

[130] *The Reincarnation of Traditional Ecological Research: The Scientific Laboratory*

Scientific labs (specifically ecological, biological, and archaeological sciences) are just modern forms of traditional ecological research — how to keep track of the resources that keep a society alive. Biologists studying salmon in the field have a pattern of behavior similar to a traditional fish camp. Biologists, archaeologists, and ecologists studying and recreating resource exploitation in the past use the same techniques as the people they're studying: low-tech problem-solving, cooperation, reciprocity, and long-term planning for the next generation of scientists.

[130] *Chair*

Isaksson, Sven (The Archaeological Research Laboratory, Stockholm University, Sweden), Peter Jordan and Kevin Gibbs

[258] *Same Same, but Different: Pottery Use among Prehistoric Hunter-Gatherers in NW and NE*

Eurasia

This is presentation of a study of similarity and difference in the use of ceramic vessels between populations of prehistoric hunter-gatherers in Northwestern and Northeastern Eurasia respectively. The comparison is based on biomolecular analyses of lipid residues extracted from hundreds of vessels. NW Eurasian material comes from a number of sites in eastern Central Sweden, primarily representing the Middle Neolithic Pitted-Ware Culture, interpreted as coastal foragers. The NE Eurasian material comes from a number of sites on Sakhalin and Hokkaido, also represented by various coastal foragers. Both similarities and differences are to be found in these materials, from either end of the Eurasian continent, results that will be presented and discussed in this presentation.

Isbell, William (SUNY - Binghamton)

[61] *Identifying and Understanding Ritual in Wari Cities: A Case Study from Conchopata, Peru*

Wari was surely the first generation state in Central Highland Peru, and one that quickly became expansionistic and imperial. Its settlements are the earliest highland cities, promoting new kinds of experience in new kinds of places. Inhabitants of Middle Horizon Conchopata, in the upper Ayacucho Valley, performed at least some kinds of craft activities, documented by specialized production tools. However, archaeological evidence for ritual appears much more prominently. This includes concentrations of large and elaborately painted jars and/or urns, that were smashed deliberately. Traditionally such finds have been interpreted as remains of public offering events. However, lesser concentrations of more modest objects also appear, generally interpreted as trash, but more recently considered probable evidence for private ritual events. Apparently, ritual activities were even more common than formerly realized in the early highland city. This paper discusses the archaeological record for economic endeavors in comparison with remains that seem to imply ritual activities, considering criteria employed by archaeologists for distinguishing each. Why do remains of ritual activities appear to overwhelmingly dominate Conchopata's archaeological record, and how important was ritual in the archaic Wari state?

[132] *Discussant*

Isendahl, Christian and Vernon Scarborough (University of Cincinnati)

[273] *Issues of Human Security at Large-Scale Transformation Events: The Case of the "Classic Maya Collapse"*

In mainstream discourse the "Classic Maya Collapse" forms an iconic case of how past complex societies have failed to follow sustainable development trajectories. Complex systems research is currently coming to grips with how a series of linked social and environmental processes interacted to fundamentally reorganize Classic Maya society, but little effort has been made to evaluate how these transformations were experienced by the generations of people that lived through such turbulent historic phenomena. Based in UNDP's multi-dimensional approach to human security and drawing on data from two different regions of the Maya Lowlands, this paper discusses how the transformation of the Classic Maya social-ecological system affected lived human experiences from the perspectives of economic, food, environmental, personal, community, and political security. Looking at different segments of society suggests that system change is associated with a series of challenges and opportunities that may not have been experienced as uniformly negative. We argue that archaeological research can provide an array of pivotal social data on human experiences of system change useful for policy-makers and in the broader global change discourse, and that it requires archaeologists to adopt widely understood terminologies that are not restricted to disciplinary jargon.

Ishida, Hajime [194] see Shimoda, Yasushi

Isla, Johny (ANDES - Centro de Investigación para la Arqueología y el Desarrollo) and Markus Reindel (German Archaeological Institute)

[214] *Proto-Nasca, Nasca Inicial o Topará? en la formación de la sociedad Nasca*

Las evidencias arqueológicas relacionadas con la época de transición entre las culturas Paracas y Nasca en los valles de Palpa, no concuerda con la visión tradicional de una "normal" transición cultural entre ambas formaciones sociales. Por el contrario, este lapso de tiempo, conocido como Proto-Nasca o Nasca Inicial, está vinculado con la repentina aparición de elementos asociados con la cultura Topará, en cuyo contexto se configuró un escenario particular que propició la continuidad de rasgos Paracas en Nasca. Investigaciones sobre el paleoambiente y fechas de radiocarbono ayudan a contextualizar este lapso de tiempo en la historia de la costa sur.

Isla, Johny [214] see Reindel, Markus

Issavi, Justine (Stanford University), Maurizio Forte (University of California), Nicolo Dell'Unto (Lund University) and Nicola Lercari (University of California)

[9] *Envisioning 3D Archaeology at Çatalhöyük*

The University of California, Merced started in 2010 a digital experiment on site with the scope to record every phase of excavation in 3D using different technologies. The project "3D-Digging at Çatalhöyük" in fact aims to virtually reproduce the entire archaeological process of excavation using 3D technologies (laser scanners, photogrammetry, computer vision, image modeling) on site and 3D Virtual Reality of the deposits of Çatalhöyük as they are excavated (in lab through teleimmersion). In this way it is possible to make the excavation process virtually reversible, reproducing digitally all the phases of excavation.

In 2012 fieldwork the digital workflow by computer vision and laser scanning was totally integrated with GIS and spatial databases and a Neolithic house (B89) was digitally recorded in 3D (by single context recording) using both technologies.

The use of 3D technologies on site as teaching and research aids, and the post processing and the implementation of all the data in the lab for the collaborative virtual visualization systems (see <http://sites.google.com/site/telearch/>) allow for a very advanced workflow for the final interpretation.

Ives, John (University of Alberta)

[75] *The View from Promontory Point*

Promontory Caves 1 and 2, originally excavated by Julian Steward and now under interdisciplinary study, provide the richest material culture in the northeastern Great Basin during a critical interval regarding Numic prehistory. Dominated by more than 300 moccasins, the Promontory assemblages involve bows, arrows, basketry, feathers, quills, mittens, mats, cordage, gaming pieces, hafted knives and scrapers, among many extraordinary instances. More than 50 AMS dates from the Promontory Caves cluster tightly between 600-830 BP in an occupation featuring a bison and antelope hunting economy, using exclusively northern obsidian sources. Yet, the Promontory Phase has an unsettled archaeological history, regarded by some as part of a Great Basin continuum and by others as distinctive. Promontory assemblages can be assessed against three propositions—that they reflect a terminal Fremont variant, the arrival of Numic speakers, or the intrusion of Apachean ancestors. Steward's Apachean suspicions were well founded: the Promontory Phase most likely involved an Apachean presence or a terminal Fremont population under northern Plains and Apachean influence. The best evidence of Shoshonean presence, a winnowing basket, dates to the 18th century. The Promontory data reinforce the notion that the northeastern Great Basin world Numic people entered was fluid

and culturally diverse.

Ivester, Andrew H. [243] see McNamee, Calla

Iwanami, Ren

[141] *Chashikotsu B Site: Pursuit of the Origin of Bear Ceremony*

Okhotsk culture is a prehistoric culture distributed along the Okhotsk sea coast of Hokkaido, the Kuril Islands, Sakhalin and during the 5th to 10th century C.E. The Okhotsk culture was a maritime adaptation culture; settlements included large pentagonal or hexagonal structures along the Okhotsk coast. Most structures contain bone mound (altars). Chashikotsu B site is in the north side of the Utoro District, Shiretoko peninsula, and lies at the entrance of the world natural heritage site. Chashikotsu Cape contains some Okhotsk period house pits and Ainu cultural remains at the northern and southern areas of the cape. Archaeological research recovered evidence of brown bear rituals in the final stage of Okhotsk culture (ca. 11th century C.E.). This evidence suggests long-term beliefs in sacred animals from the Okhotsk through Ainu cultures.

Iwase, Akira (Meiji University) and Yuichi Nakazawa (Hokkaido University)

[147] *Use-Wear Analysis of Portable Blade Tools: Organization of Technology among Upper Paleolithic Foragers in Hokkaido, Northern Japan*

Edges of chipped stone tools often serve for different tasks, and edge morphology changes through the course of resharpening processes. The present paper explores an aspect of stone tool use and modification and how it related to technological strategies of prehistoric foragers. High-power analysis of use-wear patterns will give insights into functional variability in tool edges. We also examine whether edges of chipped stone tools were resharpened according to functional change and/or continuity, in terms of relationships between estimated worked materials, usages, and degrees of edge reductions. Materials are portable blade tools (e.g., endscrapers, sidescrapers, burins, and perforators) recovered from the occupational level of Kawanishi C, an open air site in southeastern Hokkaido (42° N, 143° E), northern Japan. The occupational level is situated between En-a tephra (19–21 ka) and Spfa-1 (45–40 ka). Charcoals obtained from the hearths were dated to 22–21,000 B.P., suggesting that foragers occupied the site during the Last Glacial Maximum (LGM: 25–19 ka). Our preliminary results of tool use will illuminate how foragers organized lithic technology across the landscape where resource patches (e.g., woolly mammoths, steppe bison, berries, nuts) were dispersed under the rigorous climate of the LGM.

Iwase, Akira [208] see Nakazawa, Yuichi

Izuho, Masami [28] see Morisaki, Kazuki

Izuho, Masami (Tokyo Metropolitan University), Hirotaka Oda (Nagoya University), Ian Buvit (Central Washington University), Mikhail V. Konstantinov (Transbaikalian State Humanitarian-Pedagogical University) and Sergei G. Vasil'ev (Chita State Museum of Local History and Nature)

[222] *New AMS 14C Ages for the Upper Paleolithic Site of Tolbaga in Southwestern Transbaikal (Russia)*

Here we present several new dates on bone from the Upper Paleolithic site of Tolbaga in the southwestern Transbaikal, Russia (51°12'N; 109°18'E). At Tolbaga, archaeologists identified four Paleolithic layers, labeled 1–4 from youngest to oldest, but artifacts from layers 1–3 are considered redeposited from cultural layer 4. The lithics and faunal remains from cultural layer 4 constitute the type assemblage for the early Upper Paleolithic

'Tolbaginskaia Culture'. Based on AMS 14C dates on bone, Goebel and Waters (2000) contended the site was repeatedly occupied between 25,000-30,000 RCYBP. Over 10,000 animal bones and a few bone artifacts were discovered with 4000 lithics, as well as features. The extensive collection of faunal remains from Tolbaga represents diverse species that inhabited steppe-tundra, steppe, and open woodland environments. We will discuss the dates from the each dominant animal species which inhabited the various landscapes.

[233] *Discussant*

Jacobsen, Geraldine [3] see Fairbairn, Andrew

Jacomb, Chris [263] see Oskam, Charlotte

Jaime-Riveron, Olaf (University of Kentucky) and Christopher A. Pool (UNIVERSITY OF KENTUCKY)

[33] *Sourcing Olmec Basalt in Southern Gulf Coast of Mexico*

In this paper, we will present XRF results from an analysis of both quotidian artifacts and monuments that correspond to different phases during the evolution of the Formative period of the Southern Gulf Coast of Mexico. Diachronic and synchronic changes in the use of basalt as a raw material are important for a better understanding of transformations of long-distance exchange and acquisition of rocks for both daily life and civic-ceremonial activities in different Olmec sites. A preliminary implementation of GIS will be presented.

Jaime-Riveron, Olaf [126] see Hernandez Jimenez, Lourdes

Jalandoni, Andrea (University of Guam) and John Peterson (University of Guam)

[95] *Conflict at Contact: Late Seventeenth-Century Spanish Missions and Reducción in Northern Guam*

The case of Casa Real in Ritidian is a microcosm of the interaction between the Spanish missionaries and the Chamorros on Guam, during the tenuous Contact Period. Through historical accounts and archaeological investigations, the possible foundation of a lost 17th C. church was located. Building the church in Ritidian changed the spatial and spiritual valuation of the land. This was intentional on the part of the Spaniards, as part of the process of reducción. The Spanish material, technology, and policy introductions irreversibly transformed the local culture. Among the artifacts recovered were the stone and mortar construction material (mampostería), a brick, and trade-ware porcelain. At a native residence nearby were found porcelain sherds and iron, as well as gender specific work areas.

James, Helen (Smithsonian Institution)

[35] *Bird Bones in Hawaiian Archaeology: Causes of Extinctions, Radiocarbon Chronology, and the Marine Reservoir Problem*

Interactions between birds and people can be particularly intense on oceanic islands, because the islands provide breeding grounds for seabirds, wintering and stop-over sites for migratory birds, and year-round homes to terrestrial birds that may occur nowhere else. For instance, the Hawaiian Islands have been settled by people for a relatively short period of time, yet during that time roughly 55 species of Hawaiian birds have become extinct and are now known only from their bones. The bones were recovered from recent paleontological and archaeological sites, with the archaeological sites providing evidence of feather-collecting and harvesting of birds for food. Unexpectedly, the most abundant birds in Hawaiian archaeological sites have survived extinction, drawing into question the common assumption that human

exploitation was an important cause of extinctions for Hawaii's native birds. I review alternative explanations for the collapse of Hawaii's native avifauna, with emphasis on direct human interactions with birds, invasive species, and habitat alteration. Chronology is essential to this discussion, and in that regard I present a large radiocarbon database from animal bones, including data that support a short chronology for Polynesian arrival in the archipelago and encourage the use of oceanic seabird bones for establishing coastal radiocarbon chronologies.

James, Emma [117] see Otárola-Castillo, Erik

Janaway, Robert (University of Bradford)

[135] *Quality Assurance in UK Forensic Archaeology*

In the UK Forensic Archaeology has developed in a distinct manner, which reflects the underlying structures of policing and the commissioning of forensic specialists. Organizational structures and associated forensic provision is currently undergoing a period of rapid change. This paper will present a current overview of UK forensic archaeology, recent changes in policing and forensic provisions, and forensic regulation. Finally the paper will conclude with a brief introduction to the role of the UK National Crime Agency in providing lists of experts to investigating officers.

Janetski, Joel C. [87] see Pitblado, Bonnie

Janusek, John [50] see McCray, Brian

Janusek, John (Vanderbilt University) and Patrick Ryan Williams (Field Museum of Natural History)

[59] *Tectonic Techné in the Production of Tiwanaku Monumentality*

Stone configured Tiwanaku construction and defined Tiwanaku as a place and a people. This paper presents ongoing geoarchaeological research into the lithic production of Tiwanaku monumentality. Monumental stone production was critical to Tiwanaku's consolidation as a prestigious urban ceremonial center. Emergent technologies of lithic production and construction- encompassing extensive operational chains of stone quarrying, transportation, carving, and emplacement –propelled Tiwanaku's panregional influence and political prestige during the Andean Middle Horizon. These ground-breaking technologies, and their 'encorporation' as a distinctive and specialized tectonic techné, constituted Tiwanaku as an emergent ritual-political phenomenon.

Janz, Lisa (University of Arizona)

[168] *Why Excavation and Survey Are Inadequate When Existing Collections Are Ignored: A Case Study from the Gobi Desert*

While archaeological excavation and collection can be essential components of a well-rounded research program, the disciplinary emphasis on such endeavours has created increasingly unwieldy collections that must be curated by museums. However, the resulting collections are often too large to be fully studied by the collectors and are dismissed by descendant scholars – who themselves grapple with interpreting large-scale patterns from geographically restricted data – as unredeemably "biased" and "uncontextualized." The perfect example of this problem is the lack of research carried out on extensive assemblages from the Gobi Desert of Mongolia and China. Although these collections span an impressive temporal and geographic range, they have been largely ignored in favour of geographically restricted excavation and survey. My recent research was the first to analyse these collections and yielded a foundational chronology of technology and land-use for a region that had remained virtually unknown,

despite its acknowledged importance in technological and cultural developments across Northeast Asia. The surprising depth of the resulting data illustrates the vital and incomparably rich nature of such assemblages. This experience demonstrates the essential, but often bypassed, practice of working with existing collections prior to or in lieu of destructive excavations.

Jaroszewski, Elizabeth (Texas A&M University)

- [268] *Ceramic Analysis of Southeastern Idaho Plain Ware From the Pioneer Site, Northeastern Snake River Plain*

During the Late Archaic period, hunter-gatherers in southeastern Idaho produced plain and commonly undecorated pottery referred to by some as Southeastern Idaho Plain Ware. There has been discussion concerning the origin of this pottery with the possibility that it is a variation of Shoshone ware or a derivation of Fremont pottery to the south. The 2012 excavation of the Pioneer site (10 BT 676), located at the Idaho National Laboratory in the desert of the upper Snake River Plain, yielded a sample of ceramic artifacts that were found in undisturbed layers dating to the Late Archaic. In this research, an attribute analysis of the ceramic material found at the Pioneer site compares lithic and faunal data with known assemblages to determine whether the pottery can be best affiliated with a specific Late Archaic culture.

Jarratt, Tricia (University of New Brunswick, Fredericton) and Ramona Nicholas (University of New Brunswick, Fredericton/Tobique First Nation)

- [262] *We Are in Cahoots!*

Often, First Nations people become engaged in archaeology as members of field crews. Simply hiring First Nations people as field laborers does not constitute collaborative archaeology. We argue for a clearer understanding of what collaboration means. In community settings, archaeologists have roles as "diplomats, middlemen in an intellectual and political conversation" (Kelly 2003). While this approach reflects the role archaeologists play in bringing archaeological perspective to communities, it does not allow space for mutual learning and equal collaboration. At their best, collaborative partnerships "benefit both researcher and local communities while enhancing archaeological understanding of the past" (Malloy 2003). We explore challenges to achieving collaborative approaches, examine examples from the Maritime Provinces, and provide insight into successful collaborative relationships. Regionally, collaboration, accommodation and complex working relationships between archaeologists, Traditional people and Elders have created a dynamic setting for archaeological research that seeks to balance the two perspectives, an approach Elder Albert Marshall calls "Two Eyed Seeing." Integration of First Nations' perspectives and accountability are steps towards what we believe will be a better archaeology, and allow us to consider... "Not only reasons why we should work with local communities, but how to work with local communities" (Bender and Smith 2000).

Jarrett, Jordan (Washington State University) and Andrew Duff (Washington State University)

- [267] *Ceramic Evidence for Distinct and Concurrent Puebloan and Mogollon Cultural Traditions at Largo Gap in New Mexico*

The aim of this study is to confirm using ceramic analysis data that Mogollon and Puebloan cultures in fact coexisted in central western New Mexico during the Chaco Era of the Pueblo II period (1050-1130 AD). Previous studies have demonstrated that distinct ceramic traditions seem to be present at Cerro Pomo and Cox Ranch; yet questions still remain as to whether or not gray wares, associated principally with Pueblo culture, are manufactured locally or are imported. The present aim is to determine first whether gray wares are produced with local clays and, second, whether or not ceramic traditions at Largo Gap follow the same trends as those of nearby great house sites, primarily Cerro Pomo and Cox Ranch Pueblo. Microprobe analysis as well as low-tech refiring techniques will be used to address whether the occurrence

of gray wares as well as brown wares at Largo Gap supports evidence of a distinct Puebloan presence in this traditional Mogollon region, as opposed to being the result of either trade or of Mogollon adoption of Puebloan pottery traditions.

Jazwa, Christopher (Pennsylvania State University), Christopher Duffy (The Pennsylvania State University), Lorne Leonard (The Pennsylvania State University) and Douglas Kennett (The Pennsylvania State University)

- [58] *Hydrological Modeling and Prehistoric Settlement on California's Northern Channel Islands*

An important variable that influenced prehistoric human settlement on California's northern Channel Islands was the availability of freshwater. Existing models of settlement on the islands use watershed size as a proxy for water availability at the canyon mouth. However, in semi-arid regions, this approach has limitations where the stream may lose much or all of its flow to groundwater. We are developing a hydrological model that incorporates geospatial/temporal data for climate (precipitation, solar radiation, wind speed, relative humidity, temperature), soils, vegetation, and topography to simulate the complex land-surface-groundwater behavior of island hydrology. The model simulates dynamics of ephemeral channels and the complex exchanges of surface and groundwater. We present preliminary results of this model, both in modern environmental conditions and in the past and compare the results with existing prehistoric settlement data for these islands. We target the past 5,000 years because of the availability of archaeological and paleoenvironmental datasets used to calibrate the model. Climate projections are constructed as input to the model for 100-year intervals of very wet to very dry conditions. The supporting data and simulation are preserved in a digital on-line archive to support ongoing research on past climate conditions.

Jelinek, Lauren (Statistical Research, Inc.)

- [218] *Negotiating Identity in the Wake of Contact: Protohistoric Peoples on the Northwestern Spanish Frontier*

A detailed ethnohistorical examination of narratives from the seventeenth and eighteenth centuries demonstrates how different groups of O'odham negotiated identity at multiple scales in a colonial frontier. The Spanish referred to the O'odham as "Pimas"; however, smaller collectives within this larger group occupied different territories along the frontier and maintained disparate alliances with other non-O'odham peoples. These alliances had significant, sometimes negative, implications for the social and political relationships among and between individual groups of O'odham and their non-O'odham neighbors. This paper explores the tangled social identities of those populations that occupied the northwestern edge of Spanish colonial frontier.

Jenkins, Emma [3] see Fairbairn, Andrew

Jenkins, Tara (McMaster University and TMHC)

- [42] *Context, Needs, and Social Messaging: Situating Iroquoian Human Bone Artifacts*

Culturally modified human bone has been recovered from 31 archaeological sites in southern Ontario that span the period between A.D. 700 and A.D. 1650. Of a total of 80 objects, two were found in burial contexts and 30 in village middens, sweat lodges, and interior house refuse pits. Elements of the human skeleton were selected for retention and then transformed through cutting, polishing, drilling, and decorating to create objects for use. These artifacts are perceived to be objects of personal adornment, musical implements, grave goods and utilitarian tools. Their provenience, examined for temporal and spatial trends, demonstrates an increase in frequency and a shared and geographical widespread practice for the disposal of human bone artifacts that peaks in the late fifteenth century. A case study examining the context of the artifacts and site patterning suggests

that human bone was integrated into material culture. Patterns of manufacture and disposal suggest the artifacts were a tool used to restore longhouse health and may not be the result of torture, killing and the dismemberment of war captives. This interpretive approach allows for greater explanatory potential regarding the cultural processes that led to the deposit of human bone artifacts.

Jenks, Kelly (Fort Lewis College)

- [223] *Considering Gender in a Nineteenth-Century Hispanic New Mexican Village*

The Hispanic village of San Miguel del Vado was established along the eastern frontier of New Mexico during the late Spanish colonial period and persisted through the political, economic, and social shifts that followed Mexican independence and American conquest. Thus, this site provides an interesting context in which to consider both the nature of gendered identities at the margins of Hispanic settlement as well as the ways that these identities evolved as the political and social climate changed. This paper draws on archaeological data, documentary records, and regional oral histories to explore the practices and patterns that defined women and men at San Miguel del Vado. How did routine practices shape their vision of the world, and of their place in it? How did they understand each other's roles? And how did these roles, and identities, transform following American conquest?

- [64] *Chair*

Jennings, Michael (University of Chicago)

- [105] *Digital Archaeology in the Middle East: Recent Work in Jericho*

For the past three years, archaeologists from the University of Chicago have been working with the Palestinian Department of Antiquities to implement the use of iPads for digital recording of excavation results in the West Bank. This paper will focus on the use of iPads by the Jericho Mafjar Project (JMP) at the iconic early Islamic site of Hisham's Palace, located in modern Jericho. The idea to use iPads gained traction as we began to appreciate how well-suited they are in particular to archaeological documentation, which is fundamental to our enterprise. JMP uses Filemaker Go to maintain a project database directly in the field, streamlining the traditional process and making the project a "paperless" excavation. Devoting time to data management might be unavoidable, but the iPad allows us to spend more time doing archaeology rather than file work.

This paper will discuss the challenges and successes observed by the Jericho Mafjar project with digital technology. The city of Jericho has been associated with innovation in the field of archaeology since Kathleen Kenyon's famous excavations at Tell al-Sultan. Now that effective and affordable mobile devices have become widespread, Jericho once again finds itself a center of transformation in the field.

Jennings, Justin (Royal Ontario Museum)

- [132] *Wari: A Failed Empire?*

Since the 1950s, archaeologists have tended to argue that much of present-day Peru was incorporated into the Wari Empire during the Middle Horizon (600-1000 AD). The mounting bioarchaeological data for state-sponsored violence in peripheral zones seems to support the imperial hypothesis, as does the expanding corpus of warrior depictions in early Wari iconography. Yet, there is evidence of aborted imperial projects and few indications of state control over populations living outside of a handful of Wari outposts. In the paper, I offer an alternative explanation for Wari's role in the Middle Horizon in which military expansion occurred at the beginning of the period when both the city of Huari and the Wari state remained inchoate. As the countryside around Huari became more organized, the state turned inward and the frontiers of the nascent empire quickly collapsed leaving colonial sites

abandoned or largely isolated from their homeland. Conquest, as experienced by leaders from George W. Bush to Alexander the Great, is often far easier than consolidation. Data from the Middle Horizon demonstrate Wari's imperial aspirations—warriors likely marches across the spine of the central Andes. Military success, however, was not followed by administrative success. Wari was a failed empire.

Jensen, Anne (UIC Science LLC)

- [137] *Chronological Hygiene (It's So Hard to Find It): A View from North Alaska*

An attempt to describe the chronology of Late Western Thule in North and Northwest Alaska caused the realization that, despite some of the earliest C14 dates ever run coming from LWT sites in the area and despite considerable dendrochronological effort in the region, the state of chronological hygiene was rather dismal. Without a solid chronological framework, the logical underpinnings for studies of culture change and cultural processes do not exist. One cannot examine linkages between environmental change and cultural phenomena, look at the functioning of social-natural systems and response to perturbations, or even determine if cultures are contemporaneous if one cannot say with confidence which data points came before which other data points.

I present a revision of the Thule chronology of North and Northwest Alaska, based on examination of 700+ dates from the region, including 479 C14 dates and 160 dendrochronological dates. They were evaluated according to common criteria based on information available about each date. The resulting chronology is better supported by the existing data. It also highlights some dangers of using artifacts as chronological indicators.

Similar issues are prevalent elsewhere. Suggestions are offered for remedying the situation.

Jensen, Reilly (University of Utah)

- [183] *Fortresses of Solitude? Investigating Iron Age Defensive Networks in South-Western Caucasus*

This paper consists of the results from an archaeological surface survey of Iron Age fortresses located on the Sharur Plain, in Naxçıvan, Azerbaijan. This survey was undertaken to investigate local Iron-Age civilizations separately from their Near Eastern counterparts in the effort to contribute data towards a discussion of emergent social complexity and identity in this region. Several Iron Age fortresses were located as a result of this survey. Their data have been compiled and examined through a socio-economic approach and through the lens of landscape archaeology to determine the extent of local defensive networks and investigate at what level political integration was possible.

Jensen, Einar Lund (National Museum of Denmark)

- [271] *The Friedrichsthal Mission: The Moravian Brethren at Cape Farewell*

In 1824, the Moravian Brethren established the mission station Friedrichsthal close to Cape Farewell, the southernmost end of Greenland. During the rest of the century, the main part of the population in Southeast Greenland moved to Friedrichsthal and made up the Moravian community. The heavy increase in population caused a conflict on the settlement policy, and the Moravians had to conform to demands made by the Danish colonial authorities. This is reflected in the cultural landscape in Cape Farewell area of today. Missionaries bought or were given objects, today some of which are housed in Völkerkundemuseum Herrnhut, contributing with important information to the material culture of the population and their close connection to East Greenland. This paper presents results from a historic reconstruction of the Southeast Greenlandic in-migration to West Greenland and the encounter with Moravian missionaries.

Jeong, Yangseung (The University of Tennessee), Eun Jin

Woo (Seoul National University) and Sunyoung Pak (Seoul National University)

[22] *Comparing the Level of Dental Fluctuating Asymmetry between Hypoplastic and Non-Hypoplastic Skeletal Samples from the Joseon Dynasty, South Korea*

As part of efforts to explore the relationship between linear enamel hypoplasia (LEH) and dental fluctuating asymmetry (DFA), DFA levels were compared between a hypoplastic group and a non-hypoplastic group. Since both LEH and DFA are pathological indicators of environmental stress which are represented by teeth, it was hypothesized that the hypoplastic group would exhibit higher levels of DFA than the non-hypoplastic group. To test the hypothesis, 136 sets of Korean skeletal remains from the Joseon Dynasty (mid 15th – early 20th century, South Korea) were examined. Contrary to the anticipations of many previous studies, the hypothesis of this study was not supported. That is, the DFA levels of the two groups did not differ significantly ($F=3.469$, $p=.063$), which implies that LEH and DFA do not occur concordantly. As to the reason for this result, it was speculated that (1) different kinds and/or degrees of stressors might influence the occurrence of LEH and DFA, or (2) traditional measuring methods used for DFA research may not reflect true DFA levels. Based on this study, it is recommended that both LEH and DFA should be utilized and reported independently in future research on the environmental stress and nutritional status of human populations.

Jeremiah, Jason (Kamehameha Schools)

[203] *Discussant*

Jerrems, William, John Dudgeon (Department of Anthropology, Idaho State University) and Clayton Meredith (Department of Anthropology, Idaho State University)

[217] *Testing the Extinction Paradigm: Evidence of Tool Manufacture from Extinct Megafauna at the End of the Younger Dryas*

Pleistocene megafaunal extinctions are believed to have occurred prior to the peopling of the Great Basin and few unequivocal associations of extinct fauna and human activity have been dated to the Clovis horizon (11.3-11.0 kya). Challenging this model is evidence from the shores of Pyramid Lake, Nevada, suggesting the persistence of mammoth to 10.3 kya (terminal Younger Dryas) and human utilization of bone and ivory for tool manufacture. Using non-destructive methods we test the hypothesis that the Pyramid Lake artifacts represent osteological remains of extinct megafauna procured by humans at the end of the Younger Dryas. Micromorphological structure and elemental composition are analyzed using ESEM-EDX to identify taxon-specific histological attributes, and to assess the calcium to magnesium ratio, a discriminatory measurement between bone and ivory materials. Protein content and diagenetic carbon in both exterior and interior tool surfaces are analyzed with micro FT-IR and Raman spectroscopy to examine the crystalline structure of the mineralized tissue and the composition of the organic fraction to distinguish the more orderly and nitrogen-rich structure of ivory collagen from that of bone. Our preliminary analysis is revealing some provocative results which may well alter our thoughts on the Younger Dryas in the Great Basin.

Jeske, Robert (University of Wisconsin Milwaukee) and Roberta Boczkiewicz (University of Wisconsin Milwaukee)

[263] *Canine Scavenging and Archaeological Site Formation: An Experiment with the Milwaukee County Zoo Wolf Pack*

How canine activities affect the formation of bone assemblages at archaeological sites has been studied in a number of ways over the years. In this multiple-approach project, two episodes of controlled feeding of a wolf pack at the Milwaukee County Zoological Gardens provide insight into the visibility of scavenging on small animal carcasses. Five wolves were fed boneless meat for a minimum of two days and all feces from their enclosure

removed. Wolves were then provided a diet of chicks, rabbits and rats. Two days later, their scat was collected, screened, and examined for bone inclusions. Gnaw marks and gastric etching were noted on some bones, others were completely destroyed, but some others passed through the wolf digestive system unscathed. In several cases, multiple bones (e.g. vertebra, feet) were evacuated by the wolves fully articulated. Using another approach, wolf behavior--especially the digging of pits and caching of large bones in pits--was systematically noted and measured. In several cases, articulated deer and/or other mammal vertebra were recovered in situ. Coupled with earlier actualistic studies of canine digging behavior, the implications of these analyses for faunal interpretations at archaeological sites are evaluated.

[263] *Chair*

Jiao, Tianlong (Bishop Museum)

[66] *Interregional Interactions and Maritime Adaptations in Early Bronze Age Southeast China*

Southeast China's early Bronze Age was characterized by unique assemblages of material cultures and a high degree of regional variations in styles and technology. Archaeological evidence suggests a distinctive settlement pattern and social complexity process throughout the region. The scope of exchange networks and the increasing contacts with other inland powers played a dynamic role in the social and economic process of these Bronze Age communities. Our recent investigations at the Anshan site in Fujian Province have uncovered a rich array of new materials, allowing us to offer alternative interpretations about the subsistence patterns, inter-regional economic and cultural connections on the coast of southeast China during its early Bronze Age (ca. 2500-3500 B.P.).

[66] *Chair*

Jiao, Tianlong [66] see Lauer, Adam

Jimenez, Socorro (Universidad Autónoma de Yucatán) and Rafael Cobos (Universidad Autónoma de Yucatán)

[113] *The Peto Cream Ware of Chichén Itzá: Time and Technology*

Peto Cream Ware is one of the diagnostics ceramics of Chichén Itzá as well as other northern Maya Lowlands. Its manufacture and spatial distribution shows aspects of its use during the Terminal Classic period. The traditional model places Peto Cream Ware as the pottery that replaced the Terminal Classic Sotuta ceramics complex, however, new data obtained from recent excavations at Chichén Itzá suggest that Peto Cream Ware was used since the tenth century in the northern maya lowlands. This paper focuses on the cultural as well as technological implications of its use.

Jiménez Alvarez, Socorro [288] see Bishop, Ronald

Jin, Jennie [22] see Bae, Christopher

Jin, Jennie (Joint POW/MIA Accounting Command), Ashley Burch (Joint POW/MIA Accounting Command) and Lee

[22] *Not All Asians Look the Same: Craniofacial Geometric Morphometric Analysis of Various Asian Populations*

Previous research has shown that various morphological features of the skull can be used to distinguish specific populations commonly grouped together as "Asian" populations. For example, Berg (2008) demonstrated that metric and non-metric traits of the mandible can successfully separate various Southeastern Asian, Native Americans, and archaeological groups. However, the NE Asian samples, especially the Koreans, have not been rigorously studied. Although previous genetic and historical studies have shown that Koreans are closely affiliated to the Mongolians and

Japanese (less so with the Chinese), it has not been studied from a craniofacial morphological perspective. In our study, we collected three dimensional landmarks, as defined by Brace et al. (Seguchi, 2012) for the University of Michigan Craniofacial Database, from 100 archaeological and modern Korean crania. The collected data was then compared to the University of Michigan Craniofacial Database that has craniofacial measurements of historic and prehistoric remains from around the world, with particular emphasis on Asian, New World, and other circum-Pacific populations. Our analysis will show to which group Koreans are most closely related. The results could be used to interpret the evolutionary history of the Korean population.

Jin, Guiyun, Fu-Qiang WANG, Yu-Hai LIN and Wen-Bo ZHANG

[66] *New Evidence on Neolithic Rice Exploitation in Northern China*

As one of the important crops in modern society, rice exploitation and cultivation in Neolithic China is an interesting topic for archaeologist, anthropologist and so on. It is suggested rice cultivation originated from the lower and middle Yangtze River valley and then spread north to the Yellow River Valley and spread to the area around Shandong Highlands during the third millennium BC and then further spread east to Korean Peninsula and Japan islands. However, the latest archaeobotanic data from several Neolithic sites indicate that, around Shandong Highlands, rice exploitation occurred as early as 6000 year BC and continued from 5000-4000 year B.C. These new discoveries rewrite the early regional rice exploitation history on one hand and put forward several questions about the origin and development of rice agriculture in East Asia on the other hand.

Jochim, Michael (University of California - Santa Barbara)

[28] *Discussant*

Johansson, Lindsay (Brigham Young University)

[173] *The Buck or the Bunny? Documenting Change in Faunal Use through Time at North Creek Shelter*

Transitions are important in archaeology and much of our time is spent documenting the nature and potential causes of cultural transitions. In the eastern Great Basin and Colorado Plateau there are three major cultural transitions: the Paleoarchaic to Archaic, the Archaic to Formative, and the Formative to Late Prehistoric. Few sites on the Colorado Plateau have been excavated, and North Creek Shelter is "the only known stratified Paleoarchaic site on the Colorado Plateau" (Bodily 2009). Because of the depth of the stratigraphy, North Creek Shelter can provide important information regarding adaptive transitions throughout the past 10,000 years. In his master's thesis, Bradley Newbold (2009) documented faunal changes between the Paleoarchaic and Early Archaic; this paper discusses the relationships between the fauna from the Paleoarchaic and Early Archaic to that of the Fremont period.

Johansson, Lindsay [175] see Richards, Katie

Johns, Catherine [119] see Bailey, Laura

Johns, Catherine

[160] *What Ceramics Can Tell Us: Assemblages Indicating Activities in the Teuchitlan Culture's Guachimontones*

Critical to constructing a past culture's social organization is gaining an understanding of the differences in activities between buildings at a site. Studying the changes in ceramic assemblages is one way to identify the activities that could have occurred in

different buildings. Changes in ceramic assemblages were analyzed to investigate the social organization of the Teuchitlan Culture, at the site of Navajas in Jalisco, Mexico. The structures at Navajas form what is called a Guachimontone, a ring of platforms surrounding a circular step pyramid; these are separate ritual structures from the residential areas. Of particular importance for this analysis were 1) identifying distribution of closed mouthed to open mouthed vessels; 2) comparing utilitarian wares to the finer ritual wares; and 3) determining from this analysis what ceramic activities may have occurred in the Guachimontone circles. The analysis of the ceramic assemblage data base produced an even distribution of wares with the utilitarian ratios equally large in each structure. Based on these results there is ample evidence of daily activities occurring in ritual structures during the Teuchitlan Culture.

Johnson, John (Santa Barbara Museum of Natural History)

[12] *Sociopolitical Groups and Boundaries in Southern California: An Empirical Analysis Using Ethnohistorical Data*

For more than a century, anthropologists have developed interpretations regarding the nature of aboriginal sociopolitical groups in southern California, often coming to contrasting conclusions based upon fragmentary ethnographic data and prevailing theoretical paradigms. Information derived from the Spanish mission records pertaining to marriage patterns and other inter-ranchería interactions can be analyzed empirically to determine sociopolitical groups and boundaries and test reconstructions proposed by ethnologists and archaeologists. Using techniques derived from social network analysis and cultural geography, certain underlying processes of observed group formation become clearer. Chumash sociopolitical patterns are compared to Uto-Aztecan (Takic) groups in southern California.

Johnson, Lynn [12] see Delacorte, Michael

Johnson, Phillip (Texas A&M University), Eric Bartelink (Department of Anthropology, California State Univ), Olaf Nehlich (Department of Human Evolution, Max Planck Institut), Benjamin Fuller (Department of Human Evolution, Max Planck Institut) and Michael Richards (Department of Human Evolution, Max Planck Institut)

[138] *Coastal Settlement Disruption in American Samoa during the Little Climatic Optimum-Little Ice Age: Evidence from Stable Isotopes and Accelerator Mass Spectrometry*

Over the past 1000 years, significant climatic events had impacts on Pacific coastal margins, resulting in fluctuations in sea level and sea surface temperature. In this study, we use stable isotope data to track human diet and mobility patterns on Tutuila Island, American Samoa, derived from burials dated to 1600-1000 and 550-100 B.P. This study investigates diet and mobility prior to and post the Little Climatic Optimum and transition to the Little Ice Age, periods marked by fluctuations in sea level, sea surface temperature, and marine resource productivity. We evaluate the isotope data in light of coastal settlement patterns and subsistence models.

Johnson, Scott (Grande Prairie Regional College)

[287] *Communities in Archaeology: Influencing Field Methods and Informing Interpretation*

"Community" has been a key unit of anthropological analysis since the mid-1900s and has been enthusiastically adopted by archaeologists in the last couple of decades. Although the term "community" occurs often in modern literature, definitions range from complex and restrictive to concise and inclusive. In recent years, scholars have emphasized the individual, his or her identity and agency, and societal structure in their construction of the community concept. The diverse theory engendered in pursuit of

this so-called basic societal unit has been used to better understand cultures through their material remains.

[287] *Chair*

Johnston, Susan (George Washington University)

[211] *Dún Ailinne Then and Now*

One of the primary research contributions of Bernard Wailes was his excavations at Dún Ailinne, an Iron Age royal site in Co. Kildare, Ireland. When he began excavations there in the 1960s, there were many unanswered questions about the Irish Iron Age. These excavations filled a major gap in our knowledge of this period, and provided the basis not only for theories about the process of political centralization in Ireland but also for models applicable to other times and places. This paper discusses Wailes' contributions to Irish archaeology, and then describes ongoing research that has built on his work.

Jolie, Edward [128] see Jolie, Ruth

Jolie, Ruth (Mercyhurst University), Edward Jolie (Mercyhurst University), Daniel Mullins (Logan Simpson Design, Inc.), Jennifer Degraffenreid (U.S. Army Dugway Proving Ground) and Nate Nelson (Logan Simpson Design, Inc.)

[128] *Loom Weaving in the Ancient Great Basin?*

In the American Southwest the production of loom woven cotton cloth was widespread and constituted a hallmark feature of many Southwestern societies by A.D. 1000. Given the importance of loom products in the prehispanic and historic Southwest it is somewhat surprising that loom weaving did not spread beyond the bounds of this cultural province. However, a few suggestive clues have survived that enhance our understanding of the place of loom products in the ancient Great Basin. In this paper we consider the scarce evidence for loom woven textiles and their production and consumption from Great Basin archaeological sites and compare these data to the better known artifacts and weaving traditions of the American Southwest. Extant evidence provides support for long distance trade in loom products but also suggests episodic local production in the Great Basin. This regional comparison provides insights into the probable origins, affinities, and significance of extant Great Basin loom products while also underscoring the remarkable spatial extent of pre-contact social networks.

Jolie, Edward (Mercyhurst University)

[139] *Learning, Weaving, and Identity in the Chaco Regional System*

Between A.D. 850 and 1150, Chaco Canyon, New Mexico, witnessed the rapid construction of large communal structures where smaller settlements had existed previously and became the core of an extensive regional system in the U.S. Southwest. Despite more than a century of excavation and research, debate continues about many fundamental issues surrounding these developments. This presentation discusses new data and insights obtained from the reanalysis of largely neglected woven perishable artifacts (basketry, matting, sandals) from Chaco Canyon and several outlying sites curated in several American museums. Detailed attribute-oriented analyses focused on the examination of the cultural and geographic affinities of Chaco Canyon's occupants as well as issues of cultural and social diversity. Additional insights into Chacoan ritual practice and social identity emerge from the exploration of ritual basketry and its attendant symbols.

Jones, Eric (Wake Forest University)

[6] *Spatiotemporal Analysis of Old World Diseases in North America, A.D. 1500–1800*

The discussion of Old World diseases in 16th- through 19th-century Native America is still largely dominated by the pandemic vs. epidemic debate, which focuses on the temporal relationship between contact and disease transmission. In this research I use spatial analysis techniques to examine archaeological and ethnohistoric information on contact events and disease-related depopulation events from across the continent from A.D. 1500 to 1800. The goal is to gain an understanding of the spatiotemporal relationships between the earliest recorded face-to-face contacts and first recorded disease events and between the earliest sustained contacts and first recorded disease events. To assess the possibility of unrecorded events, which are sometimes invoked in pandemic explanations, I consider depopulation numbers and disease characteristics. The results suggest that the temporal relationship between disease outbreaks and contact is a complex one with diseases occurring before, at the same time, and after contact in various locations. The temporal relationship between contact and disease transmission was more complicated than the diametric nature of the pandemic vs. epidemic framework allows for. As such, we must restructure our approach to this question to move forward.

Jones, Terry [12] see Schwitalla, Al

Jones, Kimberly (University of Texas at Austin)

[19] *Sculpted Vessels: Content and Comparisons in Cupisnique Material Culture*

Since the initial studies by Larco Hoyle in the 1930s-1940s, Cupisnique culture in northern Peru has been defined largely by the early florescence of the stirrup spout bottle as a principal visual medium during the Initial Period (1800-900 B.C.E.). The vast majority of ceramic bottles derive from looted and excavated cemeteries in the Chicama, Jequetepeque, and Lambayeque Valleys. Recent archaeological research has permitted to refine the ceramic seriation in the context of monumental site centers across these valleys. The modeled and incised ceramic vessels within these contexts thus may serve to delimit temporally Cupisnique material culture and to frame spatially its regional influence. The interpretation of Cupisnique culture, however, has relied in equal measure on looted carved stone vessels, which may exhibit composite beings comprised of arachnid or avian features. In this presentation, I examine the content and contexts of Cupisnique stirrup spout bottles in comparison with such media as the stone vessels and monumental murals, in order to explore the ideological system linking and distinguishing between these visual media within this early north coast tradition.

[19] *Chair*

Jones, Jessica (CSU - Sacramento)

[33] *A Study of Visual Ground Stone Source Analysis within the Teotihuacan Valley*

This study explores visual sourcing as an effective means of sourcing manos and metates within the Teotihuacan Valley, when used in conjunction with NAA, XRF or microscopic petrography. Igneous rocks within the Teotihuacan Valley have a multitude of unique identifying characteristics that allow them to be visually sourced; creating a valuable supplement to more commonly used sourcing methods. As essential household items used in everyday food production, manos and metates are inseparable from their socioeconomic contexts. Changes in stone type are direct indicators of economic changes in demography, social status, market systems, craft specialization, resource utilization and availability. Visual sourcing can serve as an inexpensive, in house, non-destructive supplementary method that would increase the viability of sourcing large collections of ground stone and allow for more complete investigations regarding patterns of production and exchange.

[33] *Chair*

Jones, Martin (University of Cambridge)**[66] A Trans-Eurasian Exchange of Prehistoric Crops**

From the beginning of the 2nd millennium B.C., shared novel methods of bronze metallurgy and are encountered right across Eurasia. This Bronze Age horizon has been seen as a threshold to cultural globalization, ultimately leading to the series of networks that came to be known as the 'Silk Road'. But that doesn't seem to be its true threshold. Recent archaeological evidence suggests that well before material goods trace these networks, the farmers of Eurasia were building those networks with the product of their own labour, food.

In this lecture I relate some of the findings of bio-archaeology, genetics and palaeodietary studies that trace this very early period of interaction activity, and relate how materially poor farming communities from modern day China and Central Asia laid the foundations of a global interconnection among Eurasian communities.

Jones, Sharyn (University of Alabama at Birmingham)**[68] Amelia Earhart's Last Meal? A Review of Zooarchaeological Evidence from a Castaway Camp on Nikumaroro**

A summary of zooarchaeological evidence from the Seven Site on Nikumaroro, Phoenix Islands, is provided. This site is central to the "Nikumaroro Hypothesis" proposed by an interdisciplinary team of researchers from the International Group for Historic Aircraft Recovery (TIGHAR). Research suggests that the aviation pioneers Amelia Earhart and Fred Noonan landed their Electra aircraft safely on the atoll of Nikumaroro. Nevertheless, Earhart and Noonan were likely stranded on the island, which was uninhabited in 1937, and died there. Archaeological excavations were conducted by TIGHAR at the Seven Site in 2001, 2007, and 2010. The author analyzed a total of 4225 animal bones. The vast majority, 95 percent, of this material represents fishes (MNI=159), while a small amount of bone comes from sea turtles, rats, and birds. Two clusters of giant clams were also recovered and analyzed; the shells were pried open at the hinge or smashed with rocks to expose the meat. Faunal remains from large fire features suggest that whoever camped at the site was unselectively catching relatively small reef and lagoon fishes. This material also suggests that the fishes were cooked on an open fire, on hot coals, and that the fish heads were not consumed.

Jones, Alexandra (Archaeology in the Community)**[99] Public Education Programs Making Archaeology Accessible to Youth**

As archaeologists, we realize the survival of the profession is based on public interest and support of our various projects. However, in order to galvanize public support around archaeology and Cultural Resource Management (CRM), we have to educate them about the benefits of CRM. Many archaeologists embrace an approach anchored in adults within the community as the key stakeholders. I have taken a different approach where my primary focus is to work with the youth in the communities where I conduct archaeological research. Striking a note with young people early will increase their awareness and desire to embrace heritage preservation as adults. This paper will explore the various methods utilized to make archaeology accessible to youth. I use archaeology as a gateway for expanding their thirst for knowledge about science, technology, and their past. Thus, an emerging group of stakeholders is created who are very vocal about their new found passion, archaeology.

Jones, Robert**[122] An Archaeological Study of the Smoky Atmospheric Test**

On August 31, 1957, the Smoky atmospheric test was detonated

on a 700 foot tower at the Nevada National Security Site, formerly known as the Nevada Test Site. Besides the usual US personnel, onlookers included French and German participants who were testing their respective underground personnel shelters. The Smoky test location is very significant because the usual post-shot cleanup activities were not undertaken after the detonation. Instead, the twisted metal and other remnants of structures and objects used in the test were left in situ, making Smoky the best example of an intact post-shot atmospheric test location known in the Western world. The archaeological study of the Smoky test location covered more than 50 acres and recorded more than 1,000 artifacts that consisted of layers of twisted, broken, and melted metal tower beams and supports, machinery, and other nuclear testing materials, such as lead bricks. Structures in the area included the tower elevator assembly, underground shelters, and underground instrument stations. During the archaeological documentation, the uniqueness of this post-atmospheric testing site presented many challenges as it pushed the boundaries of conventional site recording.

Jones, Tate (LandAir Surveying), H Tate Jones (LandAir Surveying Company) and Martin E McAllister (Archaeological Damage Investigation & Assessment ()**[135] Specifications, Workflows, and Best Practices for Using 3D Laser Scanners for Forensic Documentation of Archaeological Site Damage**

LandAir Surveying and Archaeological Damage Investigation & Assessment (ADIA) have jointly used 3D lasers to document damage to archaeological sites. Formerly leading edge technology in the forensic field, laser scanning is now almost at a "Best Practices" level in any forensic documentation. The presentation will discuss the best approach to the use of high definition laser scanners to document archaeological site damage and the technical aspects of this process. "Common" terms, accuracies, and specifications for the various types of laser scanners will be presented and specific project concerns for picking the best scanner and cameras for each job will be considered. Examples of real jobs and the best work flow will be reviewed and the project approach explained for several types of archaeological site damage projects. The goal is to provide a practical knowledge of how to use laser scanning and what to expect when ordering laser scanning from contractors, including the deliverables to be expected. The discussion will include "TrueView" spherical photography, black and white scan data versus color scan data, and the different results that can be expected using different light intensity and micromesh software. There will also be information on scanner range and point cloud density.

Jones, Terrah (UCLA Cotsen Institute of Archaeology), Carly Evelyn Olenick, Lorena Becerra Valdivia and Patricia A. Arteaga**[149] Digging for Data from Backdirt: A South American Case Study**

For decades, archaeologists have faced the universal threat of looting. Tunnels, pits, and backdirt piles litter sites all over the world, resulting in disturbed stratigraphy, lost artifacts, and 'holes' in our data sets. However, looters, no matter how thorough, do not take everything. I am interested in looking to see what information can be obtained from items left behind by looters, especially with regards to zooarchaeological materials. This South American case study tests how much information concerning the acquisition and use of marine resources can be obtained from unprovenienced backdirt piles located at the Peruvian site Cerro del Gentil (PV57-59), a site located in the Andean foothills 20 km from the Pacific coast.

Jones, Emily Lena (University of New Mexico)**[168] Faunal Collections and Subsistence Transitions in the Protohistoric Southwest: Lessons Learned from Fruitland and Picuris**

In recent years there has been an increasing interest in the change in faunal use through time in the prehistoric and protohistoric American Southwest. Many of these studies have drawn on previously collected data; zooarchaeological analysis has been a component of many Southwestern projects for over half a century, and there are many datasets available for analysis. In some cases, reanalysis of previously collected assemblages is necessary for these studies, as both the questions of interest and analysis techniques have changed. In this paper, I discuss the reanalysis of two zooarchaeological collections from the protohistoric Southwest, highlighting both the challenges involved, the opportunities provided, and the ways in which differing curation methods impact analyses.

Jones, Terry (Cal Poly San Luis Obispo)

- [177] *The Bioarchaeological Record of Blunt Force Cranial Trauma in Central California*

Based on ethnographic accounts and archaeological research, warfare among indigenous populations of central California was neither rare nor infrequent. We hypothesize that violence was an integral part of central California prehistory, intimately related to maintenance of territory, sociopolitical organization, cultural identity, and resource acquisition. To test this hypothesis we analyzed the incidence of blunt force cranial trauma in osteological data from a bioarchaeological database containing records for 16,814 individuals representing the past 5,000 years. Results show that blunt force cranial trauma was prevalent throughout this span with little variation through time and comparable rates of involvement for males and females.

- [177] *Chair*

Jones, George (Hamilton College), Michael Cannon (SWCA Environmental Consultants) and Charlotte Beck (Hamilton College)

- [207] *Appraisal of the Younger Dryas Occupation of Smith Creek Cave, Nevada*

Excavations at Smith Creek Cave, Nevada, were completed more than four decades ago and yielded one of the best dated terminal Pleistocene cultural records in the Great Basin. Alan Bryan, who conducted the excavation, called this record the Mt. Moriah occupation zone. Bryan reports a series of radiocarbon dates between 9900 and 10,800 BP. Derived from hearth and floor charcoal, the dates suggest that the cave witnessed numerous brief occupations, probably by bighorn sheep hunters. Several dates in excess of 11,000 14C BP, however, have been viewed more skeptically by the archaeological community. We conducted studies at the cave in 2005 in part to assess if deposits adjacent to the previously excavated area preserved cultural materials including datable organic items. Stratigraphic exposures were reestablished and organic samples were collected for dating. We present the results of the dating of several of these samples. In addition, technological and source provenance analyses of the original Mt. Moriah assemblage are considered in light of the regional Younger Dryas cultural record.

Jones, Carleton (National University of Ireland, Galway)

- [242] *Roughan Hill: A Study of Chalcolithic and Early Bronze Age Society in Western Ireland*

The Chalcolithic and Early Bronze Age were eras of significant social change across western Europe. New technologies, ritual practices, and forms of social organization all appeared at this time. Studies of this period have tended to focus on artifacts, technology, burials, ritual monuments, and more recently stable isotope analyses of human remains. At Roughan Hill in western Ireland, six seasons of fieldwork have added a new dimension to the study of this dynamic period – an extensive landscape where contemporary habitation sites, field divisions, and ritual monuments are all present. The Roughan Hill evidence, when analyzed in conjunction with more traditional lines of inquiry, allows an investigation of prehistoric social organization that starts

at the scale of a residential group and then expands geographically and chronologically. This study attempts to explain the particularities of Roughan Hill and the surrounding region within an interpretive framework of social organization rooted in anthropology, while at the same time emphasizing the role of specific historical trajectories in the Burren and River Fergus regions of western Ireland between c. 2500 – 1600 BC.

Jordan, Alexis [40] see Laak, Emily

Jordan, Amy (University of Washington)

- [84] *Ethnic Identity or Economic Availability? The Analysis of Starch Grains at Colonial Plantations and Colonial Administration Sites in the Banda Islands, Maluku, Indonesia*

Plantations on the nutmeg-bearing Banda Islands are contemporaneous with early North American plantations and are an excellent place to investigate cross-cultural responses to colonialism. The Banda Islands were the world's sole source of nutmeg in the 16th century. Control over the spice trade was a major goal for European powers during the Age of Expansion. Consequently, the Banda Islands were a location of early disputes and colonial experimentation. Peoples from a variety of European, Asian, and other backgrounds were forced to co-exist on these remote islands and create a functional society. Historic records conflict regarding the amount of creolization or separation of cultures. Based on the assumption of ethnic preference for carbohydrate staples, as historically recorded, I compare the starch grain residue on earthenware and tradeware from three plantations sites and an administrator's residence to determine changes in trading patterns and/or preferential consumption due to the colonial process.

Jordan, James (Antioch University New England), Herbert Maschner (Idaho State University), Nicole Misarti (University of Alaska Fairbanks) and Bruce Finney (Idaho State University)

- [233] *Environmental Change and Long-term Occupation of the Eastern Aleutian Arc: The View from Sanak Island*

Islands of the eastern Aleutian archipelago and the western Alaska Peninsula (defined here as the eastern Aleutian arc) preserve long records of human adaptation to dynamically changing marine and terrestrial environments. The human occupation of this region, which marks the boundary between the North Pacific Ocean and the Bering Sea, has taken place against a backdrop of glaciation, endemic seismicity and volcanism, rapid and gradual fluctuations of sea level, and long-term climate change. This paper presents the results of recent interdisciplinary research on Sanak Island, eastern-most of the Aleutian Islands, and adjacent coasts of the Alaska Peninsula. Our work indicates that the actual and potential antiquity of settlement of Sanak and the eastern Aleutian arc is much greater than previously suspected, that humans have successfully adapted to significant shifts in regional climate and marine productivity for millennia, and that the long-term evolution of coastal ecosystems and biodiversity has been strongly influenced by both natural and anthropogenic drivers.

Jordan, Alexis (University of Wisconsin-Milwaukee)

- [248] *When Is a Bead not a Bead? Exploring the Function of an Enigmatic Iron Age Ornament*

The study of personal ornaments in the European Iron Age has long been a fruitful avenue of research for archaeologists wishing to explore topics such as social status, identity, technology, and trade. As portable pieces that can be reliably sourced and serve as stylistic, temporal, and social markers, beads reflect larger patterns of social interaction and communication especially during periods characterized by significant change and increasing mobility. In the Irish Iron Age, the systematic study of artifact types has raised new questions regarding intercultural contact and

indigenous craft production on the island. This paper will focus on glass toggle ornaments, often described as dumbbells, which have typically been categorized as a glass bead form although they lack the designating perforation. Few in number and appearing almost exclusively in Ireland, Iron Age glass toggles span mortuary, ceremonial, and settlement sites across the island. The glass toggles vary in shape and color, and bone and amber examples are known. Through an examination of emergent patterns within the site types, associated artifact assemblages, spatial and temporal distribution, and stylistic variability of the toggle, an analysis of the potential functions and archaeological significance of this enigmatic personal ornament will be explored.

Jordan, Jillian (University of New Mexico) and Keith Prufer (University of New Mexico)

[256] *Integrating Ceramic and AMS 14C Chronologies at the Classic Maya Center of Uxbenká, Belize*

Uxbenká, a Preclassic to Classic period Maya polity, is the most extensively excavated site in southern Belize; however, until recently, very little research has been conducted on the ceramic assemblage. Nonetheless, the project undertook an ambitious AMS radiocarbon dating program to create an independent chronology with which to anchor cultural developments. We have integrated existing Bayesian age models of AMS 14C dates with ceramic analyses from stratified, site core contexts to assess the relationship between these two chronological measures. These data will be used to evaluate the development and persistence of ceramic traditions at Uxbenká, specifically, the continuation of the Chicanel Sphere, a ceramic phase traditionally associated with the Late Preclassic, well into the Early Classic. We investigate how over-reliance on single proxy chronologies may be detrimental to accurate understanding of site historical sequences and how this practice may hamper comparisons between the timing of cultural developments among sites.

Jordan, Peter (University of Aberdeen)

[258] *Chair*

Jorge, Ana [258] see Knecht, Rick

Jorgensen, Mia (University at Buffalo) and Wesley Stoner (University of Missouri)

[288] *Potters, People, and Pottery: New Insight on Formative Period Teotihuacan Based on NAA and LA-ICP-MS of Ceramics from the Sites of Cuanalan, Tezoyuca, and Plaza One*

Formative Period ceramics from the Cuanalan through Tzacualli phases were analyzed using NAA and LA-ICP-MS. Paste and paint compositions for these early ceramics provide insight regarding potters' procurement of raw materials, mixing of paste recipes, and selection of decorative motifs over the centuries leading up to the formation of the Classic Teotihuacan state. When combined with ceramic typological analysis, these compositional techniques help to characterize the relationships among processes of emergent state formation and the technological identity and symbolism built into pottery. NAA, LA-ICP-MS.

Joseph, Felicia [254] see Matheson, Carney

Joslin, Terry (Central Coast Archaeological Research Consultants) and Dustin K. McKenzie (Department of Anthropology, Cabrillo College)

[204] *Tackling Technologies: Exploring Fish Bone Gorge Tool Function in Coastal California*

Early Holocene peoples living on the Pacific Coast had the knowledge and skills to capture a diverse array of marine fish

using a variety of techniques. Along the California coast, the earliest evidence of fishing technology is bone fish gorges in Early Holocene deposits. The earliest known examples of this hook-and-line strategy come from Daisy Cave on San Miguel Island, although gorges have been recovered from Early Holocene deposits on early mainland sites such as Diablo Canyon. Gorges are bipointed bone artifacts that were attached to cordage with asphaltum on or slightly offset from center. It is assumed that gorges were baited and, when swallowed, became lodged in the fish's mouth or stomach allowing the fisher to retrieve their catch. Archaeological evidence suggests that incurving shell fishhooks replaced the gorges around 2500 BP, a technological shift or choice related to the increased efficiency of shell fishhooks. This research challenges conventional assumptions on bone gorge functionality with new evidence on fishing with replicated bone gorges, ethnohistorical accounts, gorge morphology, and archaeological derived fish species captured in specific marine environments. We explore multiple working hypotheses on how gorges may have functioned as a single or composite hook or other type of tackle.

Joyce, Arthur [63] see Butler, Michelle

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

[133] *Alternative Pathways to Power in Formative Oaxaca*

In this paper, we draw on Blanton et al.'s Corporate-Network continuum to compare the emergence of politically centralized, urban polities at the end of the Formative period in two regions of Oaxaca: the lower Río Verde Valley and the Valley of Oaxaca. In both areas, we see tension and conflict between more traditional, corporate forms of authority and leaders who were trying to extend their political influence to the broader region. The outcomes of these attempts at institutionalizing more exclusionary and hierarchical forms of authority were dramatically different. The Rio Viejo polity in the lower Verde region collapsed at ca. A.D. 250, perhaps due to internal conflict. In the Oaxaca Valley, rulers of the Monte Albán polity were successful in establishing hierarchical institutions that persisted for centuries, although the evidence suggests that their success may have come via the violent suppression of internal enemies. We consider how the histories of these two regions were related to the divergent corporate institutions out of which regional authority was forged.

Joyce, Rosemary (University California Berkeley)

[171] *The Early Household as Historical Process: Lessons from Puerto Escondido and Los Naranjos, Honduras*

Excavation and analysis of assemblages excavated at Puerto Escondido and Los Naranjos in Caribbean Honduras provides a basis for understanding household life between approximately 1300 and 700 BC. Taking a practice based perspective that treats the deposits from this period as traces of the intentional actions and unreflected habitual practices of people dwelling in these early villages, this paper demonstrates how social theories focused on the historical reproduction of practices transform the sense to be made of these assemblages. The resulting "historical processual" description of life in such early villages provides a more secure basis for understanding how people living in early Honduras articulated socially with residents of other contemporary inhabited places, including providing a better way to understand local production of objects with symbolic icons traditionally used as evidence of some kind of general "influence" from the Olmec of the Mexican Gulf Coast.

[136] *Discussant*

Juarez, Santiago (Northwestern University)

[171] *Preclassic Maya Commoners: Pioneers in the Rise of Civilization*

My research at the site of Noh K'uh, Chiapas, focuses on the commoner strategies that played a fundamental role in early urbanization among the Preclassic Maya. My study stems from a large body of research that positions households as the source of economic power in complex societies. I take a step further by proposing that commoners acted as participants and developers of one of the earliest urban societies in the Americas. Recent studies have only begun to focus on the roles of commoners in the rise of early civilizations. In this paper I highlight commoner households in order to examine the roles of domestic ritual, household economies, and commoner social networks in the process of urbanization. I argue that the everyday practices of commoners were as important as the military and ideological strategies of Maya elites during the rise of civilization in ancient Mesoamerica.

Judd, Kathleen (Washington State University), Connor Corday (Washington State University), Erin Reams (Washington State University), Rebecca Higgens (Washington State University) and Brian Kemp (Washington State University)

[71] *Documenting Domestic Lineages in the American Southwest: Turkeys (*Meleagris gallopavo*) and Dogs (*Canis lupus*)*

In this study, we analyzed ancient mitochondrial DNA from the remains of turkeys (*Meleagris gallopavo*) and dogs (*Canis lupus*) to document domestic lineages maintained and managed by prehistoric Puebloan groups. The initial goal of this project is to determine the amount of regional genetic substructure that existed among populations of these species in the northern Southwest. This information is used to evaluate how useful turkey and/or dog genetic lineages are as proxies for human interactions and/or migrations. If sufficient variation and structure is exhibited by these domestic species, their continued study will be important for evaluating various hypotheses about human population prehistory, particularly when human skeletal remains themselves are unavailable for genetic analysis. The data generated in this preliminary study are cast in light of Pueblo depopulation of the Mesa Verde region and their hypothesized movement to the Northern Rio Grande region.

Julien, Marie-Anne (University of Tübingen; National Museum of Natural History, Paris) and Oleksandra Krotova (National Ukrainian Academy of Science)

[116] *Mass Kills, Small Kills, and Subsistence Economies in Eastern Europe during the Upper Paleolithic*

During the Late Pleistocene bison is omnipresent and well-represented in Paleolithic faunal assemblages from the southern steppes of Eastern Europe, where sites particularly rich in bison remains have been interpreted as the results of mass kills. In consequence, subsistence economies have been considered to specialize in bison hunting. Based on faunal analysis of Epigravettian sites from the southern steppes, we will discuss the applicability of these notions (mass kill and economic specialization) to the northern Black Sea economies.

Junker, Laura (University of Illinois Chicago), Alexandra De Leon (University of Illinois at Chicago) and Aaqib Adnan (University of Illinois at Chicago)

[84] *Craft Production, Trade, and Sociopolitical Complexity in the Philippine Metal Age*

While the "Metal Age" in Southeast Asia, variously dated between around 1500 B.C. to A.D. 800, has been a strong archaeological focus in Thailand, Vietnam, and other areas of mainland Southeast Asia, there is a limited work on this very significant period of sociopolitical transformations between the early farming societies and the emergence of complex maritime trading chiefdoms and states in island Southeast Asia, particularly in the Philippine archipelago. Archaeological work in the Tanjay and Bacong regions on the island of Negros combines regional-scale GIS-based studies examining the relationship between settlement patterns, landscape features, and resource distributions, with

materials analysis and exchange paths of key technologies (particularly ceramics and metal) for both the Metal Age and succeeding historically known maritime trading polities. This rich archaeological database allows the examination of various ways in which rising elites during the Metal Age may have manipulated objects of wealth and potent symbolism, consolidated political power and leading to the conflictive political landscapes of the early second millennium A.D. Included in this paper are the results of regional settlement studies and household archaeology in the two regions of Negros Island, as well as stylistic and compositional analyses of ceramics and iron.

[84] *Chair*

Justeson, John

[166] *The Relationship of Eclipse Doublets to the Eclipse Stations of the Dresden Codex*

The eclipse table of the Dresden Codex is a useful beginning point for exploring the models for eclipse occurrences that were used by Mayan calendar specialists, and also has the potential for application to the Mayan calendar correlation problem. This paper shows how regularities in the occurrences of eclipses separated by a single lunation constrain the placement of the table's recorded stations within actual eclipse seasons.

Kabata, Shigeru, Tatsuya Murakami (University of South Florida), Julieta Lopez (Universidad Nacional Autonoma de Mexico) and Juan Chavez (Escuela Nacional de Antropologia e Historia, Mexic)

[63] *Interregional Interaction before the Rise of the Teotihuacan State: Preliminary Results of the Proyecto Arqueologico Tlalancaleca, Puebla*

Interregional interactions are often cumulative historical processes and a newly formed polity may inherit and/or transform social networks established prior to its formation. Thus, to better understand the implications of Teotihuacan's interaction with other regions, it is critical to examine interregional relations before the consolidation of the Teotihuacan state. The archaeological site of Tlalancaleca in Puebla was one of the largest centers in Central Mexico during the Late to Terminal Formative and is known for the presence of material culture inherited by Teotihuacan, including talud-tablero style. This paper presents some preliminary results of mapping and surface collection at Tlalancaleca and discusses their implications for the nature of interregional relations during the Early Classic period.

Kadambi, Hemanth (Illinois State University)

[101] *Constituting Royal-Dynastic Identity in South India: Negotiations in a Sacred Landscape*

This paper will argue that royal-dynastic identity in early medieval South India (ca. A.D. 550- ca. A.D. 750) is clearly observed in negotiated religious practices of an increasingly formulaic Hinduism and pre-existing, local ritual behaviors. 'Memory studies' in archaeology has highlighted the creation of political and social landscapes by the re-production and re-constitution of certain pasts while ignoring others (Yoffee 2007; Van Dyke and Alcock 2003). In addition, recent literature in the study of religion and ritual in archaeology has shown, among other things, the political implications in the performance of ritual (Fogelin 2008). Such is reflected in diverse spatial organization of sacred architecture, implying a negotiated resolution to ritual performance and hence constitution of one aspect of identity (Swenson 2008). I argue that royal-dynastic identity in South India was actively created by identifying with a past physically located in the core region of its rule. In addition architectural and archaeological documentation of this landscape suggests that royal-dynastic identity constituted itself in negotiation with local non-elite religious identity. In arguing this I hope to show that royal-dynastic identity in early medieval South India was far from hegemonic as textual documents from this period may suggest.

Kadohiro, Karen (University of Hawaii at Manoa), Adam Lauer (University of Hawaii at Manoa) and Michael Pietruszewsky (University of Hawaii at Manoa)

[27] *Using Spatial Variation Analyses to Test Biological Distance Models in Pacific Populations*

Biological relationships among Pacific, coastal East Asian, and island Southeast Asian populations through time are poorly defined. Archaeological and genetic studies in Taiwan, island Southeast Asia, and Melanesia often find significant intra-island variation between the cultures and genes present in coastal versus inland areas. These patterns have likely existed since the earliest colonization of these areas, and when combined with subsequent colonizations, have led to very high degrees of genetic diversity in the southeast Pacific and island Southeast Asia. These studies and others suggest that the isolation-by-distance model, which has been found to best fit the overall pattern of genetic similarity within geographic distances for microsatellite DNA markers and craniometric traits in other parts of the world, may not be the best fit for the larger Pacific region. This study will use a set of measurements recorded in modern and prehistoric skeletal samples from East Asia, mainland and island Southeast Asia, Melanesia, Micronesia, and Polynesia. The application of spatial variation analyses, including geostatistics, spatial autocorrelation, and interpolated contour maps will be used to test the isolation-by-distance model and analyze alternative models of gene flow that may reveal other sources of spatial variation in the morphology of these populations.

Kageyama, Masa [215] see Burke, Ariane

Kahn, Jennifer [62] see Lundblad, Steven

Kahn, Jennifer (The College of William and Mary)

[255] *Household Archaeology and "House Societies" in the Hawaiian Archipelago*

In their 2001 book entitled *Hawaiki, Ancestral Polynesia: An Essay in Historical Anthropology*, Patrick Kirch and Roger Green applied a triangulation approach to understand the social structures of ancient Polynesian societies. They were the first archaeologists to employ a "house society" perspective to illustrate how Polynesian societies were organized as kin-groups and landed estates. In this presentation, I apply the "house society" perspective to study residential structures in the Hawaiian Islands. This is only fitting, since Patrick Kirch has been at the forefront of illustrating the interpretive strengths of household archaeology in the Hawaiian archipelago. Utilizing case studies from Hawaiian household archaeology, I will focus on three themes 1) How the "house" provided rights to tangible and intangible property; 2) The benefits of an architectonic focus which views residences as physical structures and living entities; and 3) How the approach can be used to understand the evolution of social ranking in Hawaiian chiefdoms.

[255] *Chair*

Kahotea, Des (University of Waikato) and Caroline Phillips (New Zealand Archaeological Association (NZAA))

[165] *Maori iwi, Hapu, and Archaeology Research Collaboration?*

The recent period in Aotearoa/New Zealand should be ideal for collaborative research between the field of archaeology and Maori iwi and hapu (tribal groups). The relatively short period of ancestral occupation (1000 years) with cultural emphasis on ancestors, the history of ancestral landscape and genealogies provides a context for archaeology to incorporate cultural knowledge and history within the paradigm of science. The Treaty of Waitangi Act 1976 and its 1986 amendment which allowed land claims since 1840 has engaged most iwi and hapu in research and presentation of evidence in hearings. The introduction of the

Resource Management Act 1991 incorporated Maori cultural values as a matter of national importance has meant that archaeologists have to engage with local iwi and hapu. The Treaty of Waitangi land claims and focus on Maori heritage in the RMA provides Maori research needs and space to engage with the field of archaeology yet any form of collaboration with Maori iwi and hapu is at best tentative. This paper reviews the relationship of the field of archaeology with Maori iwi and hapu, the changes that has occurred and asks the question why there been little or no collaborative research effort.

Kaiser, Bruce

[25] *Photon Physics in Archaeology: The State of the Art*

An in-depth review of the current state of photon physics for analysis of all types of archaeological material will be given from the perspective of a nuclear physicist. Discussion will focus on archaeological applications of high energy photon examination using X-ray fluorescence analysis of various classes of archaeological materials.

Kakoulli, Ioanna [253] see Fischer, Christian

Kakoulli, Ioanna (Materials Science & Engineering Dept. UCLA)

[253] *Chair*

Kam, Betty [5] see Bisulca, Christina

Kamei, Tsubasa [233] see Hayashi, Kazuhiro

Kamenov, George [260] see Krigbaum, John

Kamilar, Jason [215] see Reed, Kaye

Kamp, Kathryn [39] see Whittaker, John

Kamp, Kathryn (Grinnell College) and April Kamp-Whittaker (Brucemore Historic Site and Community Cultural Cen)

[127] *Invisibility is in the Eye of the Beholder: Techniques and Perspectives for the Archaeology of Children*

As archaeologists have begun to search for children in the archaeological record, there has been an increased emphasis on development of techniques for identifying the objects and places made or used by children. While these approaches have been fruitful, they do not compensate for the prior assumptions that many archaeologists bring to the construction of their research designs and interpretations. Examples from the American Southwest and Japanese Internment camps illustrate.

Kamp-Whittaker, April [127] see Kamp, Kathryn

Kannady, John [148] see Noll, Christopher

Kanne, Katherine (Northwestern University) and Katherine Kanne (Northwestern University)

[133] *Political Ponies: Human-Equine Entanglements in Political Economies, Polity Formation, and Social Inequalities*

This paper presents a new theory of how people manipulate horses to build political economies and complex political

institutions. Because horses are embedded in pursuits of wealth and power, they are involved in negotiations of identity and social status and emerge as animate markers of difference. Horses, in turn, responsively shape the nature of these endeavors. This study combines a cross-cultural study of human-horse relations with a survey of Old World Bronze Age societies where horses first became politically important. A novel integrative relational methodology is employed to investigate the changing dynamics of human-horse relationships that result in a period of significant economic, political, and social transformations.

Kanne, Katherine [133] see Kanne, Katherine

Kansa, Eric (Open Context / UC Berkeley), Sarah W. Kansa (Alexandria Archive Institute / Open Context), David G. Anderson (University of Tennessee, Knoxville), Stephen Yerka (University of Tennessee, Knoxville) and Joshua J. Wells (Indiana University, South Bend)

[188] *Web-Based Discovery of and Integration of Site File Data: The Digital Index of North American Archaeology (DINA)*

SHPO site files are key information resources for North American archaeology. However, SHPO datasets remain relatively underutilized; each state organizes data differently and, due to a host of administrative and data-sensitivity concerns, these data typically remain inaccessible. The NSF-funded Digital Index of North American Archaeology (DINA) project (David G. Anderson and Josh Wells, PIs) will integrate archaeological site file data from across the eastern United States. The project will run datasets through an editorial workflow to improve quality and consistency and to align them to a shared ontology (formalized conceptual system for integrating data). It will then use Open Context (<http://opencontext.org>), a data publication platform referenced for NSF and NEH data management plans, to index and disseminate site file records. Public data are redacted of sensitive information, including precise geographic coordinates. The project will enable search, discovery, and analysis of multi-state site file data. It will also serve as the basis for innovative "Linked Open Data" methods for integrating archaeological data distributed across the Web. With linked data, Web URI/URLs serve as primary identifiers to records, making it easy to precisely define relationships between site records and museum collections, educational materials, publications, and other research data.

Kansa, Sarah W. [188] see Kansa, Eric

Kansa, Sarah (AAI / Open Context) and Eric Kansa (Open Context & UC Berkeley)

[247] *Getting the Big Picture by Linking Small Data*
The realities of professional incentives and the lack of clear research outcomes based on shared data discourage participation in data dissemination and archiving. To address these needs, we advance a model of "data sharing as publication" with Open Context (<http://opencontext.org>) that facilitates collaborative research and analysis of multiple datasets. With funding from the NEH, we are bringing together teams of researchers who will share datasets focused on documenting trade and exchange patterns in the Late Bronze Age through Classical era Mediterranean world. Editorial workflows will help our project's researchers integrate these datasets using a simple ontology (formally defined conceptual system) and link these data to Pleiades (<http://pleiades.stoa.org>), a powerful Web-based gazetteer. In doing so, the support of data editors will enable researchers to better align individual datasets to meet new challenges of larger-scale analyses of pooled data.

Kantner, John [110] see Ware, John

Kantor, Loni (Arizona State University)

[97]

Wixárika Tukipa Groups and High Places

The tukipa among the present-day Wixárika of Jalisco, Mexico, is the setting where communal ceremonies take place. Individual tukipas are distributed throughout the Wixárika homeland, and each incorporates both architectural and landscape elements, including hills. In this paper, I describe the symbolism, layout, and ritual use of the Wixárika tukipa and associated high places, and I discuss a variety of insights that the tukipa model offers with respect to our approach and interpretation of high places in archaeological contexts. The data presented here show that high places among the Wixárika are integral to the staging of tukipa ceremonies, and that they are diverse with respect to both meaning and content. The Wixárika ethnographic case thus encourages us to earnestly consider the symbolic functions of ancient high places in connection with valley settlements, and also to diligently evaluate such places in terms of a range of possible meanings, symbolic and otherwise.

Kaplan, Jed (Ecole Polytechnique Fédérale de Lausanne, Switzerland) and Carsten Lemmen (Helmholtz Zentrum Geesthacht, Germany)

[23] *From Forest to Farmland and Meadow to Metropolis: Global Anthropogenic Land Cover Change over the Holocene*

Did humans affect global climate over the before the Industrial Era? While this question is hotly debated, the co-evolution of humans and the natural environment over the last 11,700 years had an undisputed role in influencing the development and present state of terrestrial ecosystems, many of which are highly valued today as economic, cultural, and ecological resources. Yet we still have a very incomplete picture of human-environment interactions over the Holocene, both spatially and temporally. In order to address this problem, we combined a global dynamic vegetation model with a new model of preindustrial anthropogenic land cover change. We drive this integrated model with paleoclimate from GCM scenarios, a new synthesis of demographic, technological, and economic development over preindustrial time, and a database of historical urbanization covering the last 8000 years. We simulate global land cover and human land use change, fire, soil erosion, and emissions of CO₂ and methane (CH₄) from 11,700 years before present to AD 1850. Our model results show that while climate and tectonics controlled global land cover in the early Holocene, by the early Iron Age (1000 BC), humans in Europe, east Asia, and Mesoamerica had a larger influence than natural processes on the landscape.

Kappelman, John (University of Texas at Austin), Marvin Kay (University of Arkansas), Lawrence Todd (University of Texas at Austin) and Abraham Thompson (Colorado State University)

[10] *Back to the Future: William Henry Holmes and the MSA in the Horn of Africa*

William Henry Holmes' publications from the 1890s are the first clear expositions of a production chain approach to stone tool technology. His insights are as useful today as they were then and have justifiably been credited as providing a foundation for the analytical procedures now employed globally. In advocating for their application to the MSA in the Horn of Africa, we examine a linear model of MSA stone tool production and use at sites located along the upper reaches of the Blue Nile River tributaries on the lowland slope of Ethiopia's northwestern plateau. Controlled excavations and surveys at Shinfa River localities reveal that MSA humans exploited raw materials from both river gravel bars and upland basalt flows. Flakes, points, and prismatic blades were produced by Levallois core reduction, while the recycling of extractive tools resulted in mostly maintenance items such as wedges. Coupling an understanding of this production sequence with microscopic use-wear analyses provides new information about how MSA lithic collections can be systematically classified and evaluated.

Kara, Alex (Boston University)

[208]

Total Station Mapping of Xultun, Guatemala

Eric Von Euw first mapped a small part of the Classic Maya site of Xultun in northeastern Guatemala in 1975. Beginning in 2010, the Proyecto Arqueológico Regional San Bartolo has expanded this map to cover the site's core and some of the relatively scattered mounds along its periphery. This poster displays an updated map of Xultun that was created using total station data from the 2008, 2010 and 2012 field seasons. This large image is complimented by short descriptions of the important features that were discovered during these mapping efforts. One such feature is a processional road that connects two large, ceremonial plazas. This road runs parallel to the site's largest causeway only 100 meters to the east. Diverse water management features were discovered in this same area. The relationship between these parallel roads and water management is visually displayed using GIS hydrology tools. This poster also describes the obstacles inherent to total station mapping in a tropical forest and the methodological procedures employed to overcome them.

Karasik, Avshalom [247] see Grosman, Leore

Kardailsky, Olga [47] see Matisoo-Smith, Lisa

Kardulias, Paul (College of Wooster)

[191] *Chair*

Karl, Susan [167] see Moss, Madonna

Kars, Henk [129] see Koopman, Annelies

Karsten, Jordan (SUNY Albany) and Gwyn Madden (Grand Valley State University)

[38] *The Transition to Agriculture and Its Impact on Health in Prehistoric Ukraine*

Currently, the general consensus in bioarchaeology is that the transition to agriculture resulted in a decline in health for early agriculturalists. However, most of this theory is based on data from North America, an area dependent on maize agriculture and lacking domesticated animals. Potentially, different agricultural systems may have resulted in different health outcomes following the transition to agriculture. For example, early agriculturalists in Eastern Europe cultivated a wide variety of plants and had reliable sources of animal products and protein that would have resulted in a nutritionally sufficient diet. We test the hypothesis that health declined following the transition to agriculture in Eastern Europe using skeletal data associated with the Eneolithic Tripolye archaeological culture excavated from Verteba Cave in Ukraine. The hypothesis is accepted based on a statistically significant increase in enamel hypoplasias in prehistoric agriculturalists as compared to earlier hunter gatherers. Additionally, stature was found to decrease following the transition to agriculture. The decline in overall health observed in this study may have resulted from the consequences of increased sedentism, including higher exposure to human and animal waste, as well as the maintenance of infectious crowd diseases in settlements with high population density.

Karsten, Jordan [186] see Madden, Gwyn

Kasper, Kimberly (Rhodes College)

[223] *Daily Practice of "Hidden Harvests": Postcolumbian Gender Dynamics and Traditional Ecological Knowledge in Southeastern New England*

After the arrival of Europeans to the Americas, indigenous women are often overlooked as catalysts of continuity or change in defining environmental interactions and cultural survival. It is the objective of this paper to disentangle how the daily practice of indigenous women, within the Mashantucket Pequot Nation, shaped not only their own community's processes of socio-ecological interactions (resource use, foodways, medical practices etc.) but also other arenas of political and economic systems on and off the Reservation. Through the evaluation of ethnohistorical and/or archaeological data, I explore how the Mashantucket Pequot women situate themselves as active agents and continuously engage in the use of "hidden harvests" when facing conflict and competition for resources. "Hidden harvests," such as nuts, roots, tubers and even wild grains, are tied to specific choices made by individuals within the community. These types of plants and their use are deeply embedded in the knowledge structures and allow one to gain a deeper understanding and appreciation of how indigenous women aid in cultural survival of marginalized communities within colonized landscapes.

[223] *Chair*

Kasper, Kimberly [223] see Moreland, Milton

Kassabaum, Megan (University of North Carolina, Chapel Hill)

[173] *Feasting Reconceptualized: A View from the American South*

Definitions and guidelines for identifying feasting in the archaeological record are abundant. Drawing on a variety of archaeological and ethnohistoric accounts, this paper develops a classificatory scheme that simplifies these definitions by emphasizing two continua of variation—group size and level of sociopolitical competition. In doing so, it offers a vocabulary for describing and comparing feasting events. By allowing more flexibility in the definition, this reconceptualization acknowledges the importance of a large category of feasts that are under-theorized in archaeology—those whose purpose is to build community and increase group solidarity. This focus brings the kinds of eating events common in Southeastern U.S. prehistory to the forefront of theoretical discussions of feasting. The latter half of this paper evaluates evidence for feasting at the Late Woodland period Feltus site in southwestern Mississippi. Botanical and faunal analyses show large amounts of foods commonly found on prehistoric sites in the American South. Likewise, ceramic analyses show a typical assemblage of Coles Creek varieties while the size of the vessels is exceptional. These characteristics, combined with a paucity of evidence for competition such as rare or exotic materials, elaborate burials, and other prestige goods, provides compelling evidence that Feltus was a location of noncompetitive feasting.

Katagiri, Chiaki [138] see Yoneda, Minoru

Katayama Owens, Mio [258] see Craig, Oliver

Kato, Hirofumi [77] see Friedman, Lindsey

Kato, Hirofumi (Hokkaido University)

[258] *Mobile or Settled: Cultural Functional Diversities of Prehistoric Pottery in Hokkaido Island*

Pottery making tradition in Hokkaido Island emerged back to the 14,000 B.P. Prehistoric culture in this island, had been shifted between mobile and sedentary residential system under the climate change. Pottery in the prehistoric society had made and used to adapt these life styles.

This report will present the historical dynamism of cultural functional diversities of pottery from Jomon to Epi-jomon based on the each characteristics of relation with residential patterns.

[141] *Discussant*

Katzenberg, M. Anne [194] see Waters-Rist, Andrea

Kaufman, Laura [173] see Neusius, Sarah

Kaufman, Brett (Cotsen Institute of Archaeology, UCLA)

[253] *Empire without a Voice: Phoenician Iron Metallurgy and Imperial Strategy at Carthage*
Traditional research into colonization, trade in metals, and empire formation at Phoenician and Punic Carthage has been artificially divided into the distinct fields of either biblical archaeology (Phoenician era, ~10th-6th centuries BC) or classical scholarship (Punic era, ~5th-2nd centuries BC). Synthesis of the disparate textual, epigraphic, and archaeological data requires an anthropological framework of post-colonial thought, state formation, and cultural ecology, animated by archaeological data. "Artificial" is the only appropriate word to describe this reality, as the formation of a Tyrian state, widespread establishment of colonies across the Mediterranean including Carthage, and the subsequent dominance of this latter colony represent an evolutionary process of empire formation.

Recent excavations at Carthage have provided the largest known corpus of the eponymous metal of the Near Eastern Iron Age – tuyères with iron slag still attached, loose slag, furnaces, and iron and copper alloy metals and corrosion products. The metallurgical precincts at Carthage provide evidence of state-level commissioning and decommissioning of industrial zones. Using archaeometallurgical techniques such as optical microscopy, XRF, and SEM-EDS, the data provide a diachronic perspective (~760-146 BC) of the interactions between resource management and technological selection, as well as empire formation and domestic social organization.

Kaufmann, Kira (University of Wisconsin-Milwaukee), William F. Kean (University of Wisconsin-Milwaukee), Michael Baierlipp (University of Wisconsin-Milwaukee) and David Hart (Wisconsin Geological Survey)

[125] *Interpretation of Effigy Mound Construction in the Midwest: Ten Years of Using of Geophysical Techniques for Archaeological Applications*

Geophysical and geoelectrical techniques were employed at several Late Woodland effigy mound sites in Wisconsin to better define the subsurface under and around these mound structures. The archaeological sites were surveyed using electrical conductivity, resistivity, and ground penetrating radar (GPR). Electrical resistivity profiles (ERT) were conducted longitudinally and transversely on a sample of mounds using an ARES electrical profiling system. In addition, GPR was applied along the same lines as the ERT. Variations were seen in each of the different types of data. Variations seen in resistivity data are most likely from pre-mound construction activity and some appear to be from looter's pits. Lateral variations seen in the ERT data are seen in most mounds sampled but with differing degrees. Differences in conductivity data appear to be a result of both geology and cultural construction. Variations and anomalies identified from the GPR data appear to represent different construction strategies. Resistivity variations and differences in the GPR data also suggest greater preparation for some mounds compared to others. The combined results of these techniques give an internally consistent non-invasive view which adds to the archeological interpretation of the effigy mound construction strategies.

Kawelu, Kathleen

[255]

Community-Based Research: The Next Step in Hawaiian Archaeology

In 1997 Patrick Kirch gave the keynote address at the annual Society for Hawaiian Archaeology meeting on Kaua'i. He took the opportunity to discuss the development of the field in the islands, its current status, the role of key institutions in that practice, and a future he envisioned for the discipline. Kirch lamented the shrinking part research institutions played in Hawaiian archaeology, and challenged archaeologists to be more engaged with descendant communities. The talk initiated dialog among island archaeologists, as well as individuals in Hawaiian communities. Since that time more relationships have developed between archaeologists and native Hawaiian communities, and more grassroots organizations have taken leading roles in the care of cultural sites and landscapes. This paper presents an example of community-based archaeology, in which a grassroots group seeks to protect a heiau (place of worship) threatened by harbor expansion. The assembled group included Hawaiian elders and community members, students, a state archaeologist, and Native Hawaiian archaeologists. A brief contextual background of the sociopolitical history of Hawaiian archaeology is provided, as well as coverage of the development of the project and its potential to serve as an example for similar community efforts elsewhere in the islands.

Kawika, Kanani

[143] *Discussant*

Kay, Marvin [10] see Kappelman, John

Kay, Marvin (University of Arkansas)

[220] *Neolithic and Later Arrowheads from the Balkans*

Trapezoidal microlithic arrowheads are mainly ascribed to the Mesolithic. But new discoveries and examination of museum collections delineate Neolithic and later examples in northwest Turkey, Bulgaria bordering the Black Sea, and the lower Danube River valley of Romania. Microscopic wear traces provide the key to their functional identification as transversely-mounted arrowheads of flint and obsidian.

Kaza, Konstantina [288] see Gilstrap, Will

Kealhofer, Lisa, Peter Grave (University of New England) and Ben Marsh (Bucknell University)

[65] *Empires and Dark Ages: Perspectives on the Hittite-EIA Transition in Anatolia*

The demise of the Late Bronze Age (LBA) empires in the eastern Mediterranean provides one of the iconic case studies of collapse. The abandonment of cities and government supported infrastructures across the landscape (e.g., temples, large storage facilities) is an intrinsic feature of archaeological epistemology of the collapse of political structures, or government, in complex societies. Many sites appear to have little or no occupation after political collapse. Our large scale comparative analysis of sites in western Anatolia makes it possible to highlight the limitations that have confounded our understanding of the relationship between Hittite collapse and the subsequent Early Iron Age societies. We use two sites, Gordian and Bogazkoy, which span the LBA-Early Iron Age (EIA) collapse of the Hittite Empire to interrogate how archaeologists have interpreted material signatures of political collapse and the subsequent EIA "Dark Age." We illustrate how archaeologists' understandings of transitions in political complexity are constrained by chronological resolution, sampling, and analytical scale.

Kean , William F. [125] see Kaufmann, Kira

Keay, Simon [106] see Brughmans, Tom

Keegan, William (Florida Museum of Natural History)

[167] *The Chaos of Caribbean Island Colonization in Biogeographical Perspective*

If nothing were known about the actual history of island colonization by people, it might logically be assumed to have proceeded as follows: 1) Close islands were colonized before distant islands; 2) big islands were colonized before small islands; 3) islands were colonized by the peoples closest to them, or at least by the peoples with easiest access, taking winds and currents into account; and 4) technologically more advanced peoples reached islands earlier, or reached more distant islands, than technologically less advanced peoples. Compared to these simple expectations, reality is riddled with paradoxes. Jared Diamond and I offered these observations 25 years ago. In the current presentation I consider more than two decades of research in the Caribbean islands. These studies reveal that while models derived from the theory of island biogeography provide useful frameworks, the expressions of colonization are chaotic.

[254] *Discussant*

Keeler, Dustin (University at Buffalo), Greg Korosec (University at Buffalo), Ezra Zubrow (University at Buffalo), Irina Ponkratova (North-Eastern State Universit, Magadan, Russia) and Vera Ponomareva (Institute of Volcanology and Seismology, Petropavlovsk)

[131] *Mid- to Late-Holocene Coastal Adaptations in a Volcanically Active Area on the Northeast Coast of Kamchatka, Russia*

The Ust-Kamchatsk region of northeastern Russia is subject to frequent large tephra falls from a group of several active volcanoes directly to the East. Researchers on the NSF-funded International Collaborative Circumpolar Archaeological Project (ICCAP) completed a large scale archaeological survey in the region from 2009 to 2012. This presentation will focus on the settlement pattern analysis based on the results of the regional survey. The archaeological work was done in conjunction with geological and paleoecological surveys that characterized the environmental and tephrachronological record of the area during the time period that the archaeological sites were occupied, from 6000 through 1000 BP. The development of coastal adaptations in the Ust-Kamchatsk region during this period was affected by many natural factors including climatic change, seismic uplift, shoreline change, and volcanic activity. These natural processes dramatically altered the coastal environment of the study area. There appears to be a shift in settlement pattern coinciding with the large KS1 (1800 BP) tephra fall which may have had a substantial effect on the local ecology. This is expressed by the possible abandonment of several sites that were occupied immediately prior to this eruption.

Keeney, Joseph (University of Alaska Fairbanks) and Jeffrey Rasic (National Park Service & University of Alaska Museu)

[150] *GIS Analysis of Flake Scar Patterning Applied to a Geofact-Artifact Conundrum from Sedna Creek, Arctic Alaska*

The Sedna Creek site in northern Alaska, discovered in 1964 by Karl Schlesier, contained crudely shaped cores and simple flake tools that were interpreted to represent a middle Paleolithic age occupation of the American Arctic. Other researchers concluded the assemblage represented a collection of geofacts. We recently re-examined technological attributes of the Sedna Creek specimens using a novel technique of mapping flake scar patterns with GIS. We compared the results to analyses of artifacts from well-documented archaeological contexts, and assemblages derived from experiments that simulated natural processes known to mimic purposeful flaking by humans. Our results suggest: 1) there is considerable overlap between artifacts and geofacts in regard to the technological attributes found on any single

specimen; 2) assemblage-scale patterns, however, can be used to reliably distinguish a collection of geofacts from an archaeological assemblage; 3) a holistic consideration of the geological and archaeological context of lithic specimens is crucial to establishing the mechanisms by which they were created or modified; and 4) the Sedna Creek collection consists of chert pebbles fractured naturally in a high energy alluvial environment.

Kehoe, Alice (University of Wisconsin-Milwaukee)

[29] *From Alexander von Humboldt to El Arenal Chickens: Strong Evidence and Strong Denials on Long-Distance Contacts*

Alexander von Humboldt was the first major scientist to recognize and publish (1814) evidence for contacts between Asia and America before Magellan. Twentieth-century scholars contributing to this body of data include Joseph Needham, Carl Sauer, Gordon Ekholm and Robert Heine-Geldern, David H. Kelley, and Paul Tolstoy. Most recently, publication of discovery of Polynesian chicken bones in a 14th-century site in Chile touched off the expected pro-forma rebuttal. Why do archaeologists routinely reject the high probability of Polynesian voyagers making landfall on the continent toward which they have been exploring for centuries? This paper uses history/sociology of science to discuss such steadfast dismissal of scientific probability and cultural data.

Kellawan, Rebecca [270] see Marvin, Judith

Keller, Angela (AECOM)

[36] *Farmers' Jade: The Greenstone Objects of Chan, an Ancient Maya Farming Community*

More precious than gold or silver, jade was the most valued raw material in the ancient Maya world. Recent jade research in the Maya region has focused on the extraction of raw jadeite, the staged production of carved jade objects involving commoner and elite labor, and the iconographic and metaphorical significance of jade in ancient Maya thought. The use of finished jade objects by non-elites, though, has received less systematic attention. This paper examines the significance of jade items in the lives of the farmers who formed the ancient community of Chan in the Upper Belize River Valley. A multi-year excavation program led by Cynthia Robin at the Chan site yielded jadeite and other greenstone objects from commoner households, leading family households, and the ceremonial and civic center. This rich assemblage of greenstone artifacts from across the entire community affords us an exceptional opportunity to explore the manner in which everyday farmers acquired, interacted with, and disposed of these precious objects.

[36] *Chair*

Kellner, Corina (Corina M. Kellner), Kevin Vaughn (Purdue University), Verity Whalen (Purdue University) and Hendrik VanGijseghem (University of Montreal)

[138] *Borderland Migration Patterns during a Time of Environmental and Social Challenges at the Peruvian Nasca Site of Cocahuischo (A.D. 550-750)*

During time of environmental and social challenges, migration tends to increase. The Nasca region in south coastal Peru is one of the driest places on Earth, but the Nasca culture flourished here during the first millennium A.D. Around 750 A.D., the Wari state entered the Nasca region. Cocahuischo is one of the largest Late Nasca sites in the area and occupies the borderlands between the dry Nasca region and the wetter central highlands. Using a borderlands perspective allows us to examine local agency in shaping social interaction and the extent to which the residents of Cocahuischo engaged with their expanding social universe. Bioarchaeological markers of migration, including strontium isotope analysis of teeth, were analyzed. From this small but important sample it appears that Cocahuischo was a

semipermeable site but that Nasca identity was important enough to prevent non-Nasca individuals from full integration at the site.

Kelly, John (Washington University) and Kathleen Stahlman (Powell Archaeological Research Center)

[29] *The Contribution and Biases of Highway Projects to the History of Archaeology in the St. Louis Region: A Spatial Assessment*

Since the early 1960s highway archaeology has contributed significantly to the region's culture history and its ongoing interpretation. While there have been no claims to these projects as a representative sample of the region's past, the linear nature of many of the region's large-scale transportation corridors does pose a problem that can be examined through spatial analysis. We will provide an historical perspective on this recent history by employing various spatial measures to assess the history of these efforts vis-a-vis other large scale projects in the region. This presentation thus provides a spatial-historical perspective on the last fifty years of research and its place in the history of archaeology.

Kelly, Johanna (Archaeological Services Inc.), Crystal Forrest (Archaeological Services Inc.) and Alexis Dunlop (Archaeological Services Inc.)

[42] *Examining Statistical Differences between Standard Osteological Measurements Taken in Situ vs. in a Laboratory Setting*

Legislative parameters governing bioarchaeological projects undertaken by cultural resource management (CRM) companies often dictate the type of analysis conducted. In situations where analysis cannot be executed in a laboratory setting due to policy restrictions or reasons of expediency, researchers turn to conducting analysis in the field. This study aims to determine if there is a statistically significant rate of interobserver error between lab and in situ measurements. Standard osteological measurements of 15 individuals from the Old Don Jail in Toronto, Ontario, Canada, were analyzed by three researchers. The remains were analyzed in situ 12 months prior to being analyzed in a laboratory setting. A paired t-test was performed to determine if there was significant difference between the two sets of measurements. The mean difference ($M = 0.7182$, $SD = 4.9712$, $N = 719$) was statistically significant ($t(718) = 4.2108$, two tail $p = 0.000028$), suggesting that there are significant differences between measurements taken in the field and those taken in the laboratory. The results of this study are important given that bioarchaeologists strive for high accuracy and precision, as well as replicability of results.

Kelly, Robert (University of Wyoming)

[291] *Chair*

Kelsey, Noack Myers [188] see Wells, Joshua

Kelso, Janet [222] see Fu, Qiaomei

Kelsoe, Camilla (University of Pittsburgh) and Julia Clark (University of Pittsburgh)

[178] *Pastoralists and Pots: Experimental Archaeology of Prehistoric Ceramics in Targan Nuur, Northern Mongolia*

Most potters, but especially those producing wares for their own households, exploit clay sources that are both easy to access and provide quality clay. However, a single landscape may offer several such sources. In this study, 16 clays were collected from the area surrounding lake Targan Nuur, Hovsgol aimag, Mongolia, and tested for their overall workability as determined by three quantitative measures. Test vessels were made from each

workable clay and then fired in four distinct contexts. Physical attributes of the fired test vessels were compared with those of archaeological sherds collected during pedestrian survey. This data was then used to identify likely clay sources exploited by ancient potters in the region. Combined with artifact density maps, this research provides important information regarding resource catchment zones and the seasonality of pottery production in non-sedentary, pastoralist communities.

Kemp, Brian [71] see Judd, Kathleen

Kemp, Brian (Washington State University), Cara Monroe (UC Santa Barbara and Washington State University) and Colin Grier (Washington State University)

[170] *A Tale of Two Villages: Ancient DNA Reconstruction of Salmon Fisheries at a Marpole and Late Period Village at the Dionisio Point Locality, Southwestern British Columbia*

Ancient DNA (aDNA) has been an important tool for establishing the range and diversity of Pacific salmon species procured by people of the Northwest Coast throughout the Holocene. Here, we report on aDNA species determinations for the DgRv-006 site, a Late period village that sits adjacent to a larger Marpole period village (DgRv-003) on Galiano Island in southwestern British Columbia. Recently published aDNA-derived species data for the Marpole village suggested a fall/winter season of occupation and a broad range of Pacific salmon exploitation. With new data from a Late period village in essentially the same location, we compare species profiles from the two villages to establish stability and change in salmon procurement at this important archaeological locality. The DgRv-006 species profile, as with our work at DgRv-003, allows for a better specification for the seasonality of large plank house villages in the southern Strait of Georgia. While salmon are only one resource among many that were important to the economies of these villages, the precision and accuracy of aDNA allows for a previously unavailable window on the nature of village economic life over the last 1500 years.

Kenawi, Mohamed [176] see Littman, Robert

Kennedy, John (SWCA Environmental Consultants) and Paul Burnett (SWCA Environmental Consultants)

[87] *The Carter Site (48NA1425): Update of a Multicomponent Site in Central Wyoming*

The Carter Site (48NA1425) is a multicomponent site located around a terrace of an intermittent stream in central Wyoming. The site is best known for its abundant Late Prehistoric ceramic component recovered during excavations in 1996. These ceramics share an affinity to Uncompahgre Brown Ware from the southern Rocky Mountains and northern Colorado Plateau, and hint towards long-distance cultural interactions. In 2012, excavations of over 100 square meters near the previous excavation area added only one ceramic sherd. Instead, three hearth features were documented, including a large roasting pit. Other artifacts include butchered faunal remains from bison, pronghorn, and a canid, as well as a sizable number of lithic artifacts. Additionally, an update to the surface record identified surrounding Paleoindian and Late Archaic period manifestations. Here we present a summary of the 2012 findings in the context of the previous work conducted at this site. The picture that emerges is a series of spatially discrete Late Prehistoric occupation areas that are buried in a distinct terrace deposit surrounded by uplands that were periodically occupied throughout prehistory.

Kennedy, Ryan (Indiana University)

[136] *From Agave to Winter Melon: A Paleoenvironmental Study of the Market Street Chinatown*

Nineteenth-century San José, CA was home to the Market Street Chinatown, a bustling Chinese community second in size only to

San Francisco's Chinatown. An intricate market with local and global connections supplied Market Street residents with material goods and a wide variety of foods and ingredients for culinary and medicinal use. This paper uses paleoethnobotanical data from Market Street to examine one aspect of this market: the supply and exchange of plant foods. Instead of focusing solely on the economic aspects of the market, however, this paper examines how the foods produced for Chinese consumption reflect the complicated nature of food in Chinatown. Influenced by their beliefs about food, Chinese immigrants chose to import and even grow Asian plants locally at the same time as they incorporated new and novel foods into their diet. I examine these decisions not only to better understand food beliefs within the community but also how these beliefs ultimately entangled Market Street residents within a series of complex scalar relationships, from the local and regional production of fresh produce to the sustained importation of desired foods from home.

Kennedy, Richard [147] see McCarthy, Elizabeth

Kennedy, Jason (Binghamton University, SUNY)

[178] *Scratching the Surface: The Effects of Ceramic Processing on Ubaid Period Ceramics from Kenan Tepe, Southeastern Turkey*
 The washing of ceramics for analysis is often one of the least popular jobs on excavations. However, for those interested in ceramic use-alteration studies the processing of ceramics could have profound impacts on the results of use-alteration analysis. As archaeologists we often focus on the effects of taphonomic processes on ceramic assemblages and attempt to discern how pots were used, broken, curated, re-purposed and/or disposed. However, we generally pay very little attention as to how our own processing of artifacts can alter the assemblage. In my use-alteration analysis of the Ubaid ceramic assemblage from the site of Kenan Tepe in Diyarbakir Province it was necessary to rule out recent surface attrition caused by the washing of ceramics in the preparation for analysis. In order to gauge the effects of washing on the surface of Ubaid period sherds I conducted an experiment using different ceramic washing tools and recorded the surface alteration after varying lengths of processing. This paper will present the results of the study and make recommendations for ceramic processing that will assist future researchers interested in ceramic use-alteration studies.

Kennedy Richardson, Karimah (Autry - Southwest Museum of American Indian)

[168] *Lessons Learned for Collections Management: What Has Been Learned about the Untouched Archaeological Collection of a 100-Year-Old Institution*
 Rehousing the archaeological collections of a 100 year institution has been very challenging and rewarding. Beginning in September 2010, the Autry National Center began one of the largest conservation efforts in the institution's history. Working with the esteemed Southwest Museum of the American Indian Collection, Autry staff expects to conserve and rehouse approximately 200,000 cataloged items by 2015. This vast collection consists of ethnographic and archaeological materials from throughout North, Central, and South America. The systematic archaeological collections emphasize California, the Great Basin, and the Southwest, with artifacts from renowned archaeological sites and archaeologists.

As the first phase of the collection reaches completion, in 2013, the museum has learned so many lessons about the importance of why you must re-understand your collection before rehousing it. Many assumptions were made about our Southwest Museum led expeditions that impacted the way in which it was housed years after it was collected. It was uncovering the details of each expedition that is ultimately leading to us curating and preserving

these archaeological collections in a manner that will allow it to be much more accessible in the future to researchers and tribes.

Kennett, Douglas [58] see Jazwa, Christopher

Kennett, Douglas (Penn State)

[283] *Precolumbian Agriculture, Deforestation, and Landscape Transformation in the Tropical Maya Lowlands*

The modern nation-states of Mexico, Guatemala, Belize, and Honduras struggle to balance the realities of population growth and economic expansion with the associated problems of deforestation, environmental degradation and habitat loss. This is not a new predicament. The first evidence for forest clearing in the Maya region is associated with early agriculture (2500 BC). Agriculture fueled population expansion and the formation of large communities during the Preclassic and Classic Periods (1000 BC-AD 1000). Forest habitats were cleared for fuel, building material and increasingly diverse agricultural systems. The population far exceeded that of today. Attempts to control water (e.g., dams and raised fields) and erosion (e.g., terraces) are evident in some areas and there is some speculation that deforestation exacerbated cycles of climate drying that started after AD 600 and peaked with a series of major droughts between AD 820 and 1100. These impacts contributed to the fragility of human-environmental interactions that ultimately contributed to the widespread disintegration of Classic Period Maya political systems between AD 850 and 1000.

[256] *Discussant*

Kerchusky, Sarah (Mercyhurst College)

[259] *Ethnicity, Entanglement, and Woven Perishable Artifacts on the Egyptian-Nubian Frontier: Archaeological Textiles, Cordage, and Basketry from the Tombos Cemetery, Sudan*

Ethnic identities, constructed from an actual or perceived shared culture, history, and language, are complex, negotiable, overlapping, and often expressed in different ways and to differing degrees situationally. These identities help to structure the myriad of ways that groups in contact interact. Previous research at the cemetery site of Tombos, located in northern Sudan at the southern-most extent of New Kingdom Egypt, suggests a thriving multicultural community where Egyptian and Nubian ethnic identities were periodically emphasized, muted, or entangled. This paper presents data from textiles, cordage, and basketry recovered over three years of excavations (2005, 2010, and 2011) and examines these data in light of previous research and their cultural and chronological contexts within the cemetery. A marked lack of variation in the types of textile, basketry, or cordage represented, including metric (e.g., cordage diameter, strand diameter, or angle of twist), and non-metric (e.g., ply formula, or knot types) data from both New Kingdom (ca. 1500-1050 BC) and Napatan period (ca. 750-650 BC) tombs and tumuli suggests that this aspect of local craft production may have been a point of cultural entanglement between Egyptian colonists and Nubians at Tombos.

Keremedjiev, Helen (University of Montana)

[269] *Of What Social Value is an Archaeological Site? Park Visitor Feedback of Bear Paw, Big Hole, Little Bighorn, and Rosebud Battlefields*

Feedback from the public is an essential component to make cultural heritage sites more relevant in contemporary society. Without a strong case for the continued social importance of historic places, many of these sites become vulnerable to development, or lose site integrity, before future generations can experience and appreciate the cultural landscapes. Using park visitor feedback from on-site questionnaires that were

administered in 2011 and 2012, this research examines the public's experiences and interpretations of four historic battlefields in Montana. The case studies (Bear Paw, Big Hole, Little Bighorn, and Rosebud battlefields) are not only significant archaeological sites but also have long-term cultural heritage importance for both descendant and non-descendant groups. Whether of ethnic, national, personal, and/or social value, these on-site questionnaires provide a contemporary snapshot of the ways park visitors interpret and feel about those places. Battlefield personnel and archaeologists can use this information for future on-site management plans and on-site interpretation programs.

[269] *Chair*

Kestle, Caleb (University of Illinois, Chicago), Joel Palka (Associate Professor, University of Illinois, Chicago) and Rebecca Deeb (University of Illinois, Chicago)

[140] *Which Suburb Is This?: Heterogeneity in Postclassic Settlements at Lake Mensabak, Chiapas, Mexico*

Settlement survey and test pit excavations along the margins of Lake Mensabak have indicated that most of the lake side sites have their origins in the Preclassic period, with a strong resurgence in occupation during the Postclassic. The secondary population boom provides us with an opportunity to understand Postclassic Maya conceptions of space as compartmentalized across the entire lake.

Preliminary analysis indicates that Postclassic settlement was compartmentalized into different sites with clearly different functions and socioeconomic statuses. The largest occupations at present are clustered around pilgrimage spaces within the region, including cliff art and larger hills. However, smaller settlements with little or no religious function tend to be located in a geologically and ecologically diverse set of locations across the lake. This settlement pattern suggests that though status is associated with access to sacred places, day to day survival is far more diverse a venture.

Khakhutaishvili, Nana [226] see Erb-Satullo, Nathaniel

Khrisat, Bilal [201] see Olszewski, Deborah

Kiani, Mehrdad [189] see Smith, Kevin

Kidder, Tristram (Washington University) and Yijie Zhuang (Oxford University)

[66] *Environment and the Anthropocene in Ancient China*

There is considerable debate about the timing, level, intensity and consequences of pre-modern human transformations of global environments. We review evidence for human interventions in the environment in ancient China, focusing on three aspects: 1) early farming and its effects on local and regional environments; 2) mid-Holocene climates and human adaptations; and 3) evidence of large-scale transformations of environments from later Bronze Age into early Dynastic times. Anthropogenic influences are evident early in China's history and are of considerable magnitude such that by early Dynastic times human actions are the primary environmental forcing factor in the Yellow River Basin.

Kieffer, C. L. (University of New Mexico, Maxwell Museum)

[109] *Atypical Cave Offerings: Identifying the Sacrificed Social Outcasts via Osteobiographies at Midnight Terror Cave, Belize*

The epigraphic record paints a very biased picture of elite rival males as preferred victims of sacrifice. However, the archaeological study of Maya sacrifice indicates that a wide array of individuals (including children) were sacrificed. Ritual theorists propose that individuals chosen for sacrifice are typically outsiders

either geographically or socially. Social outcasts on the fringe of society have been suggested to include: prisoners of war, slaves, cripples, sorcerers and orphans. This theory fits the Maya since captives and children who may not have been initiated into the community are noted as sacrificial victims in the archaeological record. Using

Midnight Terror Cave as a case study, paleopathological conditions and trauma will be used to create osteobiographies for some sacrificed individuals discovered there. These osteobiographies indicate that this ritual theory holds and that sacrificial victims include a wider array of social outcasts than previously thought for Maya cave sacrifice.

Kielhofer, Jennifer [184] see Fox, Mathew

Kielhofer, Jennifer (University of Arizona)

[199] *Geoarchaeological Investigations at Yangguanzhai, China: An Examination of Soil-Stratigraphic Sequences at a Middle Neolithic Site in the Wei River Valley*

This paper presents the results of the first soil-stratigraphic investigations at Yangguanzhai, a middle Neolithic site (~5,500 cal years B.P.) in the Wei River Valley of north-central China. The most well-developed buried soil in these profiles is thick, dark brown, and associated with the Neolithic occupation, while the uppermost buried soil is a thinner, light brown and less structurally developed unit associated with Han archaeology. Between these buried soils is unweathered sediment, which may have resulted from heightened flooding and floodplain deposition, and is thus indicative of landscape instability and increased sediment supply to this portion of the Wei River Valley. The Neolithic soil may also reflect greater vegetation density on the landscape, as inferred by its dark brown color and higher organic matter content. Based on field observations and corresponding laboratory analysis, it is clear that the inhabitants of Yangguanzhai experienced dramatic paleoenvironmental change over the course of the middle and late Holocene. Additionally, such paleoenvironmental shifts may have prompted site abandonment between the Neolithic and Han periods, as there is little archaeological evidence for occupation in this interval.

Kikiloi, Kekuewa

[195] *Unraveling the "Mystery" of Nihoa and Necker Islands, Hawai'i: Ethnohistorical and Archaeological Approaches in Studying Sociopolitical Transformation*

Nihoa and Necker (Mokumanamana) islands are often referred to as Polynesian "mystery islands," representing remote and marginal landfalls that appeared to have been settled and later abandoned by the time of European contact. This research re-examines these perceptions of island marginality and abandonment to instead reveal evidence that Hawaiian chiefly elites sustained a ritual based occupation of these islands for a four hundred year period (ca. A.D. 1400-1815) through the sponsorship and maintenance of a voyaging network between these satellites and the main islands. Through the use of ethnohistorical and archaeological approaches as independent methods, it will be demonstrated how these islands played a critical role in the development of a complex metaphysical world view concerning mana (i.e. ritual power) which essentially aided in ideological production (through ritual) and Hawaiian state religious formation. The analytical power of these interpretations will show reciprocal benefits of each method in understanding the sociopolitical realities of the past. It will highlight how each method shapes and informs different views concerning the past, both of which are valid and beneficial in opening a world in ways not accessible to a single approach.

[203] *Moderator*

Kikuchi, Hiroki

[228] *Horse Sacrifice in Pre-Qin Age, China*

This study examines changes in horse sacrifice practices during the Pre-Qin Age in China through zooarchaeological research of equid remains from excavated archaeological sites, ancient literature, and inscriptions. During the Pre-Qin Age, horses, cattle, sheep, pigs, dogs, and chickens were ceremonially sacrificed. In this presentation, I highlight distinct patterns in horse sacrifices. Horse sacrifices started during the Late Shang era (14th-11th century B.C.) and later expanded to the Yellow River during Western Zhou (11th-770 B.C.) and Eastern Zhou (770-221 B.C.) periods, which is significantly later than the appearance of other sacrificial practices. Furthermore, in principle, horses are always buried complete. In addition to these obvious distinctions, detailed zooarchaeological analysis of these horses show diachronic and synchronic changes in the age and size of the equids selected for sacrifice. At first, middle-aged and colt horses were buried. However, the Spring and Autumn Period was a turning point when the horse burials included colts, and after that more foals were sacrificed compared with the previous period. In this presentation, I will consider the implications of the changes in horse sacrificial practices within the Pre-Qin Age (Shang/Zhou Dynasty) ritual system.

[228] *Chair*

Kikuchi, Hiroki [228] see Maruyama, Masashi

Kilikoglou, Vassilis [178] see Müller, Noémi

Kilikoglou, Vassilis (Institute of Materials Science, NCSR Demokritos), Ourania Kouka (University of Cyprus), Maria Relaki (Open University, UK), Vasif Sahoglu (University of Ankara) and David E Wilson (University of Western Ontario)

[288] *Populations, Potters, or Shapes: What's on the Move in the Kastri Group?*

In the second half of the 3rd millennium B.C. an Anatolianizing influence is visible in the ceramic repertoire of the Aegean with the introduction of several new shapes, collectively known as the 'Kastri Group'. This new set of pottery, whose stylistic roots lie in Western Anatolia, has prompted ideas of instability followed by migrations to the islands of the Cyclades and of new trade networks.

This project investigates Kastri Group ceramics from Akrotiri Thera, Ayia Irini Kea, along with Liman Tepe and Bakla Tepe on the western coast of Asia Minor, with the aim of re-examining such interpretations.

Using a combination of thin section petrography and NAA we examine aspects of provenance and technology, especially the choices made in the selection and manipulation of raw materials. Rather than comprising imports from Asia Minor, the pottery vessels of the Kastri Group are shown to exist in a variety of island fabrics, indicating varied Aegean sources and pottery traditions for these characteristic shapes. A period of prosperity is indicated, with clear continuity from earlier ECII horizons, and 'Kastri Group' pottery embedded in the patterns of regional production and exchange in the Cyclades.

Killackey, Kathryn [9] see Vasic, Milena

Killackey, Kathryn (Killackey Illustration and Design)

[9] *Drawings and Dialogues: Illustrating Landscape at Çatalhöyük*

This poster presents the process of illustrating the landscape surrounding the Neolithic site of Çatalhöyük. The reconstruction is the result of the site's illustrator, geoarchaeologist, and

archaeobotanists collaborating from 2010 to 2012. Most people only see an archaeological reconstruction in its final form, presented in a publication or in a museum display. While a completed reconstruction serves a role in visually transmitting ideas to academic and public audiences, the process of visualizing can be just as valuable. The reconstruction starts as a partially formed image in the mind of the archaeologist and through a series of drawings and dialogues becomes increasingly solid and detailed. This process provides a space in which to explore and test hypotheses, helping to flesh out ideas, uncover contradictions, and identify gaps in knowledge. At the same time, the illustration process is one of elimination, the whittling down of alternative hypothesizes and making concrete one of many options. By presenting the entire process here, the viewer can see the series of decisions that lead to this final image of Çatalhöyük's Neolithic landscape.

[9] *Chair*

Killebrew, Ann

[247] *Chair*

Killebrew, Ann [247] see Olson, Brandon

Killick, David (University of Arizona)

[93] *Invention and Innovation in African Iron Smelting Technology*

The recent literature on technological change is marred by persistent confusion of the terms invention and innovation. I argue that these are not synonyms, but have distinct meanings that are essential to understanding the variety and distribution of past technological processes. I illustrate this argument by considering African iron smelting technology. Sub-Saharan Africa has long been disparaged by Europeans as a sub-continent that has seen little technological change since the initial adoption of agriculture and metallurgy. Yet archaeometallurgists have recorded much greater variety of bloomery iron smelting processes in sub-Saharan Africa than in all of the rest of the Old World. I argue that the distinction between invention and innovation is crucially important to understanding why there are more variants of the bloomery process in Africa than elsewhere in the Old World.

Killick, David [181] see Chiu, Scarlett

Killoran, Peter (University of Wisconsin-Whitewater), David Pollack (Kentucky Archaeological Survey), Heather Worne (University of Kentucky), Stuart Nealis (University of Kentucky) and Emily Vanderpool

[40] *Preliminary Analysis of the Human Remains Associated with Eastern States Hospital, Lexington, Kentucky*

The initial 1816 conception of Eastern State Hospital was to serve as a state funded hospital serving the poor (paupers). The Financial crisis "Panic of 1819" delayed its construction. In 1924 Eastern State would open under a new mission of serving those with mental health disease, cognitive and developmental impairments. In 2005 as part of the installation of water line eleven individuals in a mass grave were documented. At this time it became apparent other unmarked graves were present at the site. Excavations this past year due to expansion of the hospital have recovered just slightly fewer than 150 individuals. The purpose of the analysis of the remains is to answer question about the health, status and treatment of those with cognitive impairments during the nineteenth century. Analysis includes a presentation of population demographics; including distribution of sex, weight, stature and biological affinity. Health of the population as it represents the support by the society will be evaluated. Interpretations of patterns of cranial shape and size anomalies as

far as health impacts will be discussed. A description for the methods of reconstruction and morphometric analysis will be presented.

Kim, Nam (University of Wisconsin-Madison)

[15] *Co Loa: An Ancient Capital City of Vietnam*
 Archaeological research in Southeast Asia has grown dramatically in recent decades, widening our understanding of developing sociopolitical complexity and "urbanism" in the region. Many researchers, for instance, recognize the significance of "classical" states, such as Angkor, and their large-scale settlements with sophisticated hydraulic systems. Interestingly, earlier analogues are discernible in societies of the first millennium BC, many of which can highlight the sociopolitical trajectories and factors contributing to the development of large-scale settlements that might be considered the earliest cities and urban centers of Southeast Asia. Specifically, the region is home to a general pattern of moated settlements extant during the first millennium BC. Perhaps the largest example is the heavily fortified Co Loa site in Vietnam's Red River Valley, considered to be an ancient capital for nascent Vietnamese civilization. The scale and extent of Co Loa's massive earthen rampart system reflect planning and implementation by a highly centralized and institutionalized authority, one with access to and control over considerable labor and resources. Using recent field data, this paper explores emergent statehood in Southeast Asia, as well as Co Loa's place within a global category of ancient, large-scale settlements.

[15] *Chair*

Kim, Bumcheol (Chungbuk National University, Department of Archaeology and Art History)

[22] *The Larger, the Safer?: Understanding Changes in Household Patterns in the Transition of Early to Middle Bronze Ages, Central-Western Korea*

The transition from the Early Bronze Age (EBA) to Middle Bronze Age (MBA) in Central-Western Korea witnessed drastic changes in household patterns; such as a decrease in household size, changes in domestic production patterns and the composition of task groups, the appearance of household clusters, and even a transformation of familial relations (e.g., the dissolution of the extended family systems into a nuclear family system). Current research successfully characterizes an apparent phenomenon observing changes in dwelling data, but their research does not address the relationship between this phenomenon in reference to its interactions with the macroscopic socioeconomic changes at the time. In fact, these phenomena (at least partially) could represent various lines of socioeconomic change, especially in the formation of a political regional economy that accompanied an intensification of rice-based agriculture.

It is argued here that in order to participate in this agricultural intensification necessary to produce the surplus requested by the newly-emerged complex sociopolitical institutions, changes in household structure were needed. The MBA rice producing households transformed their structures from larger households of extended family members (that were advantageous for the distribution of products) to smaller households of nuclear family members to facilitate intensive production.

Kim, Jieun (The University of Tennessee, Knoxville)

[22] *Potentials of Transition Analysis in its Application to Korean Archaeological Skeletal Samples*

Age-at-death estimation methods developed on the U.S. reference human skeletal samples have been applied to Korean skeletal samples with a lack of knowledge of the reliability/accuracy of the results. To address this problem, a precision study comparing four different age-at-death estimation methods, including three

"traditional" age-at-death estimation methods and a relatively new age-at-death estimation method, Transition Analysis, was conducted on undocumented Korean skeletal samples from the Joseon Dynasty (the late 14th-early 20th century). The study evaluated theoretical and technical problems inherent in the "traditional" age-at-death estimation methods, and strengths of Transition Analysis that are known to overcome some of the problems. The results indicate that Transition Analysis is superior in providing more realistic age-at-death distributions of the past Korean population and, therefore, can be recommended for age-at-death estimation of Korean archaeological skeletal samples. Additionally, the age-at-death distribution created from the Korean skeletal samples was compared to an age-at-death distribution constructed from death records on Korean family genealogies from the same period. The results indicate inconsistencies in the two different age-at-death distributions. Explanations for the inconsistencies include intra-/inter-population variability in Korean past populations, sampling/preservation bias in archaeological skeletal samples, and systemic bias in the family genealogies.

Kim, Kiryong (Hanyang University in Korea) and Kidong Bae (Hanyang University in Korea)

[22] *Stone Industry and Chronology of Mansuri Site, Korea*

Mansuri is an Early Paleolithic site located in the central part of the Republic of Korea. The base of the site contains riverbed gravels, while the upper layers are comprised of alternate beddings of sand and silt. Aeolian and colluvial sediments were deposited above the fluvial deposits at the bottom. Five cultural layers have been identified. In general, the cultural deposits are comprised of Early Paleolithic core and flake tools. As in many other areas of Korea, these stone tools are considered expedient. It should be noted that some of the cores from the upper cultural layers appear to be more exhausted than those from the lower cultural layers. The upper cultural layers are estimated to have been deposited between 50 ka to 100 ka, while the cultural deposits from Layers 4 and 5 could be much older than 100 ka. In this regard, a 26Al-10Be date of 0.52 Ma from Layer 5 could inform us of the oldest age of the hominin occupation at the site.

Kim, Kiryong [22] see Lee, Chulmin

Kim, Myeung Ju (Dankook University College of Medicine), Min Seo (Dankook University College of Medicine), Chang Seok Oh (Seoul National University College of Medicine) and Dong Hoon Shin (Seoul National University College of Medicine)

[22] *Archaeoparasitological Studies in Korea*

In Korea, like other pioneering countries, the presence of ancient parasites in archaeological samples has been studied, not only for information relating to the specific parasitic infections in human history, but also to reveal any socio-cultural factors influenced by parasite infection that may have been prevalent in the past. Archaeoparasitologists in Korea have examined ancient sediments and/or coprolites from archaeological sites using morphological or molecular techniques. In these studies, various species of ancient parasite eggs were discovered. They include *Trichuris trichiura*, *Ascaris lumbricoides*, *Clonorchis sinensis*, *Metagonimus yokogawai*, and *Paragonimus westermani* among others. Based on these studies, we have realized that the parasite infection pattern in Korea has changed continuously in the past. The genetic information of ancient parasites also could be successfully obtained by ancient DNA (aDNA) studies. Ancient DNA analyses in Korea have made important contributions because the information obtained from the studies could serve as an invaluable window into the history of parasitic infections in different historic and prehistoric human populations around the world. This work was supported by the Seoul National University Research Grant (Brain Fusion Program 2012).

Kim, Minkoo (Chonnam National University) and Jungjae Park (Seoul National University)

[70] *Ancient Land-Use Dynamics in the Yeongsan River Basin, Korea: An Integrated Archaeobotanical Approach on Pollen, Seed, and Wood*

This paper presents an integrated archaeobotanical examination on wetland sites in the Yeongsan River basin, Korea, and discusses its implications in the context of woodland management around the sites. The study provides an overview of pollen, seed, and wood analyses at four archaeological sites, which collectively cover the period of 2000 BC – AD 600. Previous pollen research on swamps of the region revealed that oak and pine were the two major woodland components and that pine became prevalent at the expense of oak with agricultural expansion. An increasing dominance of grass in the pollen assemblages also represents the existence of agricultural activities. The current investigation on archaeological deposits presents similar trends in vegetation change but also provides additional information. The results show that at some large settlements the chestnut tree was the most dominant taxon measured by the amounts of wood fragments and pollen. Such abundance suggests that the site occupants managed the neighboring woodlands and promoted the propagation of the chestnut tree in a way that was comparable to the woodland management in prehistoric Jomon of Japan. The study highlights the importance of integrated investigation on macro- and micro-botanical remains in shedding light on ancient land-use dynamics.

Kim, Ha Beom (University of Oregon)

[289] *A Comparative Study of the Impact of Early Agriculture on Human Ecology in North China and Korea through a Paleoethnobotanical Perspective*

In archaeology, early agriculture is often discussed in terms of a cultural response to external stimuli like climate change and cultural contact. However the discussion less often extends to the changes in human ecology and natural landscape as a consequence of agriculture and related cultural activities. In this study, I compare prehistoric societies in two regions, North China and Korea, which show a long history of prehistoric cultural exchange. Early agriculture in the two regions share some similar characteristics, especially concerning the domesticated cultigens involved, yet at the same time constituted different subsistence economies. By using macroscopic- paleoethnobotanical data and statistical analysis, the study suggests that different modes of early agriculture in North China and Korea have had different impacts on human ecology and natural landscapes. By combining the study's findings and climatic data from the Mid- and Late Holocene, the study also considers the lasting significance of different agricultural economies to the cultural trajectories in the two regions.

Kimber, Tom, Vincenzo Poppiti, Daniel A. Contreras, Nicholas Tripcevich and Yuri Caverio

[33] *Quantifying Quarrying: Investigations at the Source of Quispisisa-type Obsidian, Ayacucho, Peru*

The Quispisisa obsidian source is the most northerly major source of obsidian in modern-day Peru. Previous exploratory work at the source has documented evidence of prehispanic obsidian quarrying on a scale not previously described elsewhere in South America. In this paper we describe the preliminary results of a program of archaeological survey and excavation, part of a project investigating the character and chronology of obsidian exploitation at this source. We detail extensive quarrying of Quispisisa-type obsidian and evidence for both occupation and substantial secondary lithic reduction at the source itself, complemented by evidence of extensive obsidian reduction in the nearby settlement of Marcamarca. Using geospatial data derived from high-precision GPS and total station mapping and preliminary results from survey

and excavation, we develop the first detailed estimates of the scale of exploitation of Quispisisa-type obsidian. Juxtaposing these with comparable well-documented obsidian quarries (e.g., Chivay and Alca in Peru, Zinapecuaro and Pachuca in Mexico and Göllü Dağ in Turkey) and regional patterns of obsidian consumption in the Central Andes, we characterize extraction and production at this important Central Andean source and establish a framework for examining changes in obsidian exploitation over time.

Kinaston, Rebecca (University of Otago), Hallie Buckley (Department of Anatomy, University of Otago, Dunedin), Stuart Bedford (School of Culture, History and Language, ANU College of Asia and the Pacific) and Stuart Hawkins (School of Culture, History and Language, ANU College of Asia and the Pacific)

[138] *Paleodiet, Horticultural Transitions, and Animal Husbandry during Lapita and Post-Lapita Periods in Vanuatu (3000-2300 B.P.)*

Lapita populations were the first settlers of Remote Oceania, including Vanuatu, reaching the archipelago ca. 3100 B.P. The specific nature of Lapita subsistence has long been debated and little is known about animal husbandry practices during Lapita colonization. This paper reports the stable isotope analysis ($\delta^{13}\text{C}$, $\delta^{15}\text{N}$ and $\delta^{34}\text{S}$) of Lapita and post-Lapita burials ($n = 24$) from Urihip Island, Northeast Malekula (~3000-2000 B.P.) in an attempt to enhance our understanding of diet and subsistence during this formative period of Vanuatu's past. The stable isotope analysis of 103 modern plant and animal samples and 45 prehistoric faunal samples from Vanuatu were used to create a dietary baseline for the Urihip individuals. The stable isotope evidence indicates that Lapita-associated individuals were consuming protein resources from the reef, inshore and terrestrial environments, with pigs being a likely source of terrestrial meat. During the post-Lapita period there was a transition to lower trophic level terrestrial protein resources, likely starchy root vegetables, for both humans and pigs suggesting the intensification of horticulture. The isotope data are further interpreted within the environmental and cultural context of colonization and settlement on Urihip.

Kinaston, Rebecca [219] see Buckley, Hallie

King, Robert (Bureau of Land Management)

[137] *The Iditarod Trail: One Hundred Years Old and Counting!*

This paper briefly examines the history of the Iditarod National Historic Trail in Alaska, from its origin in 1908 through today. It also provides an overview of past and ongoing archaeological and historical research projects, with some of them the focus of other papers in this session. Further, this paper also reports on current work by the Bureau of Land Management in managing the Iditarod National Historic Trail for today's population as part of the BLM's recent National Landscape Conservation System. Included in the discussion are also various recent partnership efforts involving BLM and other owners of Trail segments as well as various interested parties and special organizations. Finally, this paper recounts certain special events and accomplishments that have happened so far during the Trails' special five-year 100th anniversary celebration period of 2008-2013, which ends soon.

King, Maureen (Desert Research Institute)

[122] *The Perplexity of Recording Cultural Resources at Atmospheric Nuclear Test Sites*

Despite a general awareness of nuclear atmospheric testing, little is known from the perspective of the material remains on the testing landscape. The overall image that emerges when visiting these locations for the first time is disconcertingly complex. During tests, devices were detonated on the surface, suspended from balloons, mounted on towers, and air dropped leaving behind an

array of material remains from staging areas, structures, and instrumentation. Artifacts and features lack analogs that can be easily envisioned to provide a frame of reference. This study investigates atmospheric testing from the view of the cultural resources that remain on the landscape by presenting data from a series of atmospheric test locations at the Nevada National Security Site. The compilation of post-test materials, when untwined, provides a nuanced record that adds an important dimension to our understanding of the atmospheric testing era.

King, Stephanie (VCU), Michael Rohrer (VCU) and Dane Magoon (JPAC)

[190] *A Comparative Analysis of Claggett (18PR40), Hatch (44PG51), and Claremont (44SY5) Ossuaries in Terms of Mortuary Practice*

Secondary ossuary interments are typical Native American burial features associated with the Late Woodland and Contact periods in coastal Virginia and southeastern Maryland, and early historic accounts provide glimpses of an extended burial process. Many questions remain, however, regarding the potential stages and activities associated with the extended ritual process as well as the potential length of time between the death of an individual and final interment within an ossuary burial. This paper will examine skeletal remains from three sites (44SY5, 44PG51, and 18PR40) to identify and analyze potential marks associated with mortuary processing within an extended burial sequence. The series from the Claggett Farm site (18PR40), with a MNI of 281 from a single ossuary deposit, dates to the Late Woodland II period (AD 1250 to Contact). Ossuary 1 from the Claremont site (44SY5), with a MNI of 14, also dates to the Late Woodland II period. In contrast, the series from the Hatch site (44PG51), with a MNI of 36, dates to the Late Woodland I period (AD 900 to 1250) and is comprised of primary interments. The analysis will focus upon examination of processing indicators located on the distal and proximal ends of the major long bones.

King, Geoffrey [215] see Bailey, Geoff

King, Eleanor (Howard University)

[257] *African Americans, American Indians, and Heritage Education*

Heritage studies have become critical not only for archaeologists, historians, and other scholars, but for officials in federal and state parks and forests eager to preserve the past in order to inform the future. One key concern of all these constituencies is the marked lack of minority voices in the discussion of what heritage studies entail. African Americans, American Indians, and others whose history forms an important part of our collective heritage are underrepresented in this burgeoning field. Their absence can be attributed to a number of factors, including economic hardships that dictate the pursuit of more obviously lucrative careers. In part, though, it is a question of education and exposure. Many minority students are not aware of heritage studies. When they do learn what is possible, it can become for them a powerful way of reclaiming their own past. This paper examines that process through the lens of a unique field school that unites African American and Apache students in an exploration of their joint history in the Southwest. Evaluation of the results after nine years of work suggest that a strong grasp on a personally relevant past is a powerful motivator for future engagement in heritage studies.

[232] *Discussant*

Kinison, George (University of West Georgia)

[6] *Actualistic Experiments on the Regional Taphonomy of the Soils of Northwestern Georgia: Effects on Osseous and Dental Remains*

When skeletal remains are discovered in Georgia, they are often eroded or degraded due to the properties of the soil in which they are found. This project quantifies the taphonomic effects of the soil

of Georgia on skeletal remains (archaeological and forensic). This region's soil is naturally acidic and high in iron due to the concentration of igneous rock that runs through the northwestern portion of the state, based on soil data taken from USDA surveys. The effects of soil chemistry are compounded by the clay soil composition, which retains water that permeates the remains and speeds taphonomic processes. This study ran fifteen assays, each with bone and tooth, using *Sus scrofa domestica* (pig) as a research analogue for human remains. Samples were placed in varying solutions of acid and iron oxide, using distilled water as a solvent, and were observed for thirty days. The effects on the remains were recorded at regular intervals both macroscopically and microscopically. The results of this study will permit archaeologists to recognize taphonomic damage related to soil chemistry. This study will serve as the foundation for future work that will develop a predictive model for estimating length of time and chemical concentration.

Kintigh, Keith (Arizona State University), Francis McManamon (Arizona State University) and Katherine Spielmann (Arizona State University)

[10] *Enhancing Data Comparability and Research Collaboration with tDAR: The Digital Archaeological Record*

The ability to easily compare and synthesize research results can have a huge impact on the productivity of a scientific research community. Meaningful comparisons across data sets created by different investigators demand both adequate documentation of the data semantics and the capacity to represent the datasets within a common schema. For research going forward, the adoption of standard terminologies and analytical procedures minimizes key problems of data comparability. Less obviously, these same standards can be leveraged—using semantic tools for data integration—to incorporate legacy datasets and the work of investigators who have not adopted the standards. The Digital Archaeological Record (tDAR) is an international repository for digital archaeological data that facilitates thorough metadata documentation of the archive's datasets documents, and images. In addition to providing discovery, access, and long term preservation of its digital resources, tDAR provides research communities with data sharing capabilities and semantic tools that permit diverse recording schemes to be mapped to a common "ontology" for data integration. The experiences of an international community of archaeological fauna analysts in developing standards and that community's use of tDAR's data integration tools provide lessons for paleolithic archaeology as it moves to develop standards.

Kintigh, Keith W. [89] see Strawhacker, Colleen

Kinzig, Ann [89] see Strawhacker, Colleen

Kipnis, Renato (Scientia Consultoria Científica) and Pedro Da-Gloria (Departamento de Genética E Biologia Evolutiva - Universidade de São Paulo)

[217] *Paleodietary Patterns among Early Foragers in Lowland South America*

For a long time our collective imagination of hunter-gatherers societies has been one of which hunting plays a key role in shaping the social, cultural and economic structure of those societies. The human colonization of the Americas is widely portrayed as groups of hunters following mammoth herds into the arctic region, down North America, eventually reaching Tierra del Fuego. In this paper, we present strong evidence based on paleodietary studies that this is not the case. A series of zooarchaeological and bioarchaeological studies in Central Brazil shows a prevalent collecting strategy as humans began to settle in the lowlands of South America, indicating that gathering might have been much more important than previously believed. A detailed analysis of the faunal remains from archaeological sites in Central Brazil indicate that the diet breadth during the Late

Pleistocene and Early Holocene was broad, with the inclusion of several low-ranked resources, and the absence or scarcity of high-ranked items. High prevalence of dental caries, abscesses, osteoperiostitis, more circular femur shape, and low prevalence of accidental traumas observed in dozens of human skeletons from Central Brazil archaeological sites suggest high-carbohydrate diet, low mobility, and low risk behaviors relating to accidental injury.

Kirakosian, Katie (UMass Amherst)

- [29] *Cause and Effect: Social Networks and Archaeological Excavations*

Understanding the complexities of local social networks is a critical area of study for any regional history within American archaeology. As a case study, I present a (working) social network that spans seven generations of Massachusetts archaeology. I illustrate how various archaeological excavations were made possible because of already established ties within this social network. Conversely, I consider a more recent trend in which archaeological excavations create new ties while also strengthening others as well. Finally, I consider reasons for these changes through time.

Kirakosian, Katie [207] see Doucette, Dianna

Kirch, Patrick (Univ. California Berkeley)

- [167] *Vulnerability and Resilience in Island Socio-natural Systems*

Islands provide model systems for processes such as nutrient cycling and limitation, and for the long-term dynamics linking human populations with their ecosystems. This paper presents results from a multi-disciplinary investigation of long-term dynamics in three Polynesian socio-natural systems. A comparative approach allows for investigation of cultural responses to ecosystem change, within three societies which trace their origins back to a common ancestral society, and which adapted to islands with distinct environmental parameters. The research draws upon the well-developed body of theory known as resilience theory (or panarchy), as well as on the concept of differential vulnerability of island ecosystems.

- [255] *Discussant*

Kirch, Patrick [283] see Rick, Torben

Kistler, Logan (Penn State University), Lee A. Newsom (Penn State University), Bruce D. Smith (Smithsonian Institution) and Beth Shapiro (University of California, Santa Cruz)

- [172] *Bottle Gourds in the Americas: New Ancient DNA Evidence Points to African Origins and Independent Domestication*

Bottle gourd (*Lagenaria siceraria*) was one of the world's earliest and most broadly distributed domestic plants. It evolved in Africa, but its robust fruits are known archaeologically in eastern Asia by ca. 11,000 B.P., and in the Neotropics by ca. 10,000 B.P. Following bottle gourd's early archaeological appearance in the Americas, it enjoyed broad New World distribution and use throughout the Holocene. Bottle gourd fruits serve as excellent natural containers, fishnet floats, and other utilitarian items, and bottle gourd was brought under domestication more than once in diverse world regions because of its usefulness and versatility. However, the origins of prehistoric bottle gourds in the Americas are poorly understood. Competing theories include trans-oceanic drift from Africa or Asia, or introduction by Paleoindians entering the New World during the Late Pleistocene. We use targeted high-throughput DNA sequencing and analysis of diverse modern cultivars and wild specimens, plus archaeological gourds from North, Central, and South America, to assess the best model of origin for bottle gourds in the New World. We conclude that wild gourds likely dispersed on ocean currents from Africa, established naturalized New World populations, and underwent independent

domestication on one or more occasions in the Americas.

Kitazawa, Minoru [208] see Nakazawa, Yuichi

Kiura, Purity [225] see Dillian, Carolyn

Kjolsing, Jason (UC San Diego)

- [238] *Out of the Sunken Court and into the Back Rooms: Factional Ritual Specialization at a Tiwanaku Temple*

Recent investigations at the Omo site complex in Moquegua, Peru have resulted in a more detailed understanding of Tiwanaku ritual architecture in one of its main colonies. Extensive excavations of the monumental temple at Omo have uncovered integrative, shared spaces as well as a series of small rooms with access patterns suggesting divided factional lines. Rather than focusing on the public spectacle and communication of power relations inherent in monumental architecture, I focus on the intimate ritual spaces within the Omo ceremonial center. This poster summarizes the finds from two multi-room structures in the most restricted parts of the temple's upper platform excavated between 2010 and 2012. While a cohesive organizational and planning process is suggested by a similar multi-room blueprint for both structures and a simultaneous construction event, strictly divided routes of access suggest separate, private ritual uses of the temple apart from the central sunken court. Together, the finds suggest a mixture of factional moiety ritual specialization within a unifying processual experience through the sacred passages of the temple.

Klassen, Sarah (Arizona State University)

- [89] *Diversity and Resilience in Mimbres Mortuary Context*

This poster addresses issues of diversity and resilience in Mimbres society. It assesses social variables, as reflected in mortuary context, with regard to the diverse relationships emerging from ecological and social interactions. These relationships transformed over time in response to changing ecological and social diversity, as is noted by the difference in burials between Classic Mimbres and Post Classic Mimbres sites. The primary investigation involved determining the association between skeletal remains and grave goods at a Classic Mimbres site. Using bowl design analysis and artifact distribution in comparison with the gender and age of the associated individuals, I addressed issues of identity and gender, as reflected in the mortuary practices, in the context of diversity and resilience in Mimbres society.

Klaus, Haagen (Utah Valley University), Rosabella Alvarez-Calderon (Graduate School of Design, Harvard University), Melisa Del Alcázar Orosco (Departamento de Mastozoología, Museo de Historia N), Fernando Carranza Melgar (Universidad Peruana Cayetano Heredia) and Rocío Torres (Lambayeque Valley Biohistory Project)

- [286] *Integrating Bioarchaeology and Mortuary Archaeology within a Holistic Framework: Life, Death, and Adaptation in a Postcontact Andean Community*

In this paper, we employ funerary archaeology and bioarchaeology as a dual "datum point" to develop a holistic vision of ritual, health, and social change. Our 2009-11 excavations at Eten, Peru (Colonial Period) documented 492 burials of indigenous Muchik peoples. Burials were characterized by invariant Spanish Catholic mortuary practices while the population lacked evidence of widespread metabolic stress and disease – in stark contrast to their neighbors in Morrope, a setting of substantial postcontact ritual resistance, hybrid mortuary patterns, and poor health. How could such stark synchronous contrasts arise? Answers emerge from integration of ecological, zooarchaeological,

paleoethnobotanical, architectural, and archaeometric analyses. Eten's unique microenvironment provided resources for diverse diets that buffered against postcontact health stress and a strong local economy spanning pastoralism and self-sufficient production and trade of ceramic wares. Eten may not have seen "successful conversion" but was a setting of viable native adaption to the colonial world, limiting loci of mortuary pattern-encoded resistance and biological stress. This paper not only argues for cross-disciplinary bioarchaeology-funerary archaeology synthesis, but contends the extent of synthesis should include wider archaeological contexts (*sensu* Buikstra 1977) to strive for the most holistic reconstructions possible with burials and bones as the unifying focus.

Klein, Rebecca (U.S. Army National Guard)

[281] *ACUB/REPI Lands for Offsite Archaeological Mitigation: A Marriage Proposal*
Data recovery at archaeological sites that are adversely affected by Department of Defense undertakings is not always a viable option. This may be because the sites are located within an impact area or other location that cannot safely or logically be excavated. In these cases, nearby sites that are similar in nature may be set aside for preservation or, conversely, excavated as "stand-ins" for the impacted site within the Section 106 process – activities known as offsite mitigation. The Army National Guard proposes the development of a collaborative relationship between the Army Compatible Use Buffer (ACUB)/Readiness and Environmental Protection Initiative (REPI) program and the cultural resource management program to use Compatible Use Buffer lands to conduct offsite mitigation for archaeological sites.

Klenck, Joel (A.S. Historic Preservation Office)

[228] *Roman to Early Arab Subsistence Strategies in the Levant: Zooarchaeological Data from Tel-Mampsis and Tel-Nessana.*
An analysis of faunal remains from archaeological contexts from Tel Nessana and Tel Mampsis, in the Levant, dating from Roman through Early Arab periods (100 B.C. to A.D. 850), indicates the persistence of dietary patterns, particularly the consumption of domesticated pig. Zooarchaeological data compliments Roman and Byzantine sources and suggests the emergence of an increasingly arid environment in the Southern Negev and Northern Sinai. This evidence challenges the prevailing notion that Roman and Byzantine populations were able to settle in this region principally due to their construction of terraced fields and cisterns.

Klessig, Barbara (Humboldt State University) and Jasmine D'Angelo (Humboldt State University)

[240] *GIS and the Distribution of Textile Tools in Viking Age Graves in Gotland, Sweden*
The use of Geographical Information Systems (GIS) has become of increasing importance to archaeologists in analyzing the distribution of archaeological sites and artifacts. This paper explores how ArcGIS has contributed visual documentation of the distribution of textile tools from Viking Age graves in Gotland, Sweden. Using ArcGIS we generated maps showing the distribution of textile tools throughout the ninety-two parishes of Gotland, giving us a visual representation of the location and dispersal of tools. By examining the maps produced we are able to observe the counts of each tool type for each parish, provide clear illustrations of where the tools were predominantly found and the ratio of tools to graves in a given parish. The creation of maps using GIS provide visual evidence in recognizing which of the parishes were most likely to be producing textiles and which had little or no indication of textile production.

Kligmann, Debora (CONICET - UBA (Argentina)) and Veronica Williams (CONICET - UBA (Argentina))

[199] *Contributions of Sedimentological Analysis to Discuss Site Functionality: A Case Study at Compuel, Salta Province, Northwest Argentina*

In many sites of the Andean region, a special type of architectural structure called "celdas" has been found. These "celdas" are related to the Inca presence in the south sector of the Collasuyu. The function of these structures remains unknown since they have not been widely studied. Given the scarcity of material remains usually associated with the structures, we here present the results of a geoarchaeological study, designed to offer information that will allow us to discuss their functionality. A sedimentological analysis has been performed, taking several attributes into account such as color, pH, phosphorus and organic matter. The goal of this study was to look for anthropic modification of the substrate. The study area, named Compuel, is located in the province of Salta between the Calchaquí Valley and a high altitude desert called Puna, at 3400 masl. In both of these environments there is evidence of pre Inca as well as of Inca occupation. The information presented will allow us to discuss human occupation of the area as well as the relationships between local populations and the imperial administration in a region of northwest Argentina.

Kliskey, Andrew [23] see Murphy, John

Klokler, Daniela (Museu Nacional - UFRJ)

[168] *From Recovery to Discovery: Analysis of the Faunal Collection from Cabeçuda Shellmound*
Amidst renewed interest in shell site studies, Brazilian researchers are rediscovering collections and their information potential. Excavations during the 1950s at the Cabeçuda Shellmound recovered a myriad of data for archaeologists. While the bioanthropological collection has been studied by generations of researchers, the remaining assemblages were left practically untouched at the Museu Nacional in Rio de Janeiro. Analysis of the faunal collection and the discovery it contained more than 16,000 shell beads provided unique access to a portion of the site that no longer exists. The endeavor also faced many challenges, including gaps in documentation, lack of proper work space, and limitations on data analysis. The value and potential of such materials suggest new guidelines are needed to facilitate researchers' access to collections so these important tools can be used to expand knowledge of the past.

Kloulubak, Sylvia [244] see Finney, Suzanne

Klucas, Eric (Statistical Research, Inc.)

[175] *Reflections on Tortolita Phase Community Integration in the Northern Tucson Basin*

Archaeological excavations at the Richter Site (AZ AA:12:252[ASM]), a large multicomponent habitation site in the Northern Tucson Basin, have produced large contiguous exposures dating to the Tortolita Phase (ca. A.D. 500-700) ideally suited for an examination of early Pioneer period site structure. The excavated sample comprised a moderately large burial population exceeding 240 individual graves. The burials were clustered in what appear to be true "cemeteries" in that the location and function of the space was maintained for an extended period of time. In this paper I explore how mortuary behavior, especially the location and maintenance of cemetery areas, functions as a means of fostering and maintaining a shared identity among group members. These approaches focus on the information-carrying potential of the cemetery as an element of the built environment, with the cemetery functioning as a physical manifestation of the group's history. The data from the Richter site suggest that while the cemeteries demonstrated a common community identity, individual household identities were maintained as well.

Kluiving, Sjoerd [129] see Koopman, Annelies

Knabb, Kyle (University of California, San Diego), Ian Jones (University of California, San Diego), Thomas Levy (University

of California, San Diego) and Mohammad Najjar (UCSD Levantine Archaeology Lab)

[201] *New Evidence for Fatimid Period Rural Settlement in Southern Jordan*

Historical accounts of the Fatimid and Crusader periods describe continued settlement and lively commercial activity in southern Jordan. Despite this, archaeological projects have been relatively unsuccessful in identifying sites from the corresponding Middle Islamic I period (11th-12th c. CE). To address this lacuna, our paper will present evidence for rural settlement during the 11th and early 12th centuries CE based on survey results from the Wadi al-Feidh, within the Petra region of southern Jordan. We suggest that the perceived lull in settlement can be explained by five main factors: the difficulty identifying pottery from this period; a corresponding tendency to lump all handmade pottery into the later Ayyubid/Mamluk period (late 12th-16th c. CE); survey bias; hyper-regionalization in ceramic types and settlement patterns; and a lack of excavated sites for this period. We argue that the settlement pattern during the Middle Islamic I in Wadi al-Feidh represents a continuation of occupation and olive cultivation that began during classical times. These results fill a long-standing gap in our knowledge of Islamic archaeology in the southern Levant.

Knapp, Michael [47] see Matisoo-Smith, Lisa

Knauf, Jocelyn [69] see Tang, Amanda

Knecht, Rick [20] see Larson, Greger

Knecht, Rick, Ana Jorge (University of Sheffield) and Kate Britton (University of Aberdeen)

[258] *The Form and Function of Ceramics in Arctic Prehistory*

The widespread presence of ceramics in prehistoric Eskimo/Inuit sites on coastal Alaska suggests that clay vessels were an important technology for marine foragers. Here we review the types and distribution of ceramics in the Arctic archaeological record. While ceramics appear in the Bering Sea region by 2500 rcy BP, stone vessels and other functional analogues of ceramics were utilized by marine foragers in the Aleutians as early as 9000 rcy BP. After the introduction of ceramics, stone vessels continued to be used in areas of both the western and eastern Arctic that lacked local clay sources. Ethnographic and archaeological data on the function of stone vessels may be useful as we consider the role of ceramics among prehistoric cultures of the Bering Sea.

Kneebone, Ron [275] see Barrett, Thomas

Knigge, Ryan (University of Minnesota), Kieran McNulty (University of Minnesota) and John Soderberg (University of Minnesota)

[94] *Assessing the Value of Geometric Morphometrics for Understanding Quadruped Petroglyphs at Jeffers*

Among the thousands of petroglyphs found at Jeffers are several groups of quadrupeds, some of which appear to be bison. Others appear to be deer. Many are ambiguous. One goal of the Jeffers scanning project is to provide detailed three-dimensional data on carvings that will advance the identification and understanding of such shapes. Do the 3D models provide opportunities to identify new diagnostic features? Does a quantitative analysis of similarities and differences among the quadruped carvings suggest relationships useful for understanding the petroglyphs? Are there elements of posture or other subtle aspects of shape that link different carvings? This paper explores the quadruped carvings with geometric morphometrics, an analytical method that focuses on fundamental geometric shape by removing "superficial"

variation such as size, position, and orientation. A series of landmarks used to capture the shape of the animals depicted in the engravings are superimposed by a generalized Procrustes analysis to translate, rotate, and scale each specimen.

Relationships are then explored through principal component and discriminant function analyses. The goal of the paper is to evaluate the utility of landmark-based geometric morphometric methods for understanding petroglyph variability.

Knipper, Corina [142] see Fisher, Lynn

Knobloch, Patricia (Institute of Andean Studies)

[132] *Envisioning an Empire: From Ecstatic Huarpa Shamans to Divine Wari Overlords*

In the northern Ayacucho region of Peru's highlands, Huarpa culture flourished over several centuries prior to the Middle Horizon Wari culture. Archaeologists define it by a ceramic style and associated habitation sites scattered throughout a fertile valley area. From the perspective of Huarpa traditions, this paper addresses indications of antecedent processes that may have contributed to Wari's state formation. For example, this isolated society solidified a coherent identity among agrarian communities; the largest underlies Huari's ruins - the empire's assumed capital – thus, fostered its development. And, out of necessity, their apparent seclusion was breached by possible partnerships within coastal and selva populations. Intriguing images of Huarpa shamans appear on early south coast Nasca vessels. Huarpa art displays ecstatic imagery most likely engendered from tropical intoxicants. Huarpa's contacts eventually instigated interdependencies as well as dramatic artistic changes. Potters designed a bestiary of creatures that may represent animism of natural and celestial landscapes. As ceramic art changed into "Wari" styles, Huarpa leaders did not "go quietly into the night". Their traditions were suitably enhanced by revivalism of icons with staffs of symbolic authority - derived from the more ancient Chavín and altiplano cultures - thereby expediting the empowerment of Wari leadership.

Knudson, Kelly (Arizona State University)

[172] *Stable Strontium Isotope Analysis: A New Method for Investigating Paleodiet in Archaeological Remains*

Archaeologists commonly use isotopic methods, such as carbon and nitrogen isotope analysis, to investigate paleodiet in human and faunal remains. More recently, utilizing the fractionation of stable isotopes of strontium has been used to examine paleodiet through identifying the trophic level of the strontium sources in the diet. Stable strontium isotope compositions (reported as $\delta^{88/86}\text{Sr}$) vary in a mass-dependent manner; advances in instrumentation now enable the measurement of these data. Mass-dependent strontium isotope data from tooth enamel and bone from individuals buried during the Late Intermediate Period (c. AD 1000-1300) in the large cemeteries of Chiribaya Alta, Chiribaya Baja, San Gerónimo, and El Yaral in the Ilo and Moquegua Valleys of southern Peru demonstrate the utility of measurements of strontium isotope fractionation as a new tool for archaeological investigation of paleodiet. In addition, this technique now allows archaeologists to generate paleodietary ($\delta^{88/86}\text{Sr}$) and paleomobility ($\delta^{87\text{Sr}/86\text{Sr}}$) data from the same sample, which minimizes destructive analyses and allows archaeologists to directly examine the strontium sources in the diet, which is important for paleomobility studies that rely on radiogenic strontium isotope analysis.

Knudson, Kelly [286] see Torres-Rouff, Christina

Knüsel, Christopher [9] see Haddow, Scott

Knutsson, Helena (Uppsala University) and Kjel Knutsson (Department of Archaeology and Ancient History, Uppsala University)

[196] *Cognitive Tool Categories in Prehistoric Quartz Assemblages: The Analysis of Fracture Patterns and Use Wear in a Case Study of Stone Age Sites from Eastern Central Sweden*

This paper presents an attempt to identify prehistoric cognitive quartz tool categories based on the formal qualities of flakes and flake fragments found on Stone Age sites. Use-wear and fracture pattern analysis of 543 artifacts from 21 Mesolithic and Neolithic Stone age sites in Eastern Central Sweden form the basis of the discussion. It is concluded that most tools are unmodified flakes and flake fragments may have been put to a range of uses and used to work different raw materials. Although cognitive categories based on types of fragments are identified, the edge qualities, rather than on formal qualities of the flake or flake fragment have been the important selection criteria.

Knutsson, Helena [196] see Knutsson, Kjel

Knutsson, Kjel and Helena Knutsson (Stoneslab, Säves vg 40, 75263 Uppsala, Sweden)

[196] *The Final Stage of the Postglacial Colonization of Fennoscandia, Regional Blade Technologies and the Use of Local Raw Materials*

During recent years several new Stone Age sites have been surveyed and excavated that in the early Holocene were situated close to the melting Weichselian ice sheet in the inner parts of the Scandinavian Peninsula. The finds sheds new light on the pioneer settlement of the area. A joint European project investigates these materials, and a complicated process of movement of people into the de-glaciated areas of inner of Scandinavia is indicated. The main focus in my part of the project is the analysis of the chaine operatoire of selected assemblages consisting of the complex blade technologies typical for this period. My idea is that transmission of knowledge between groups and generations, as well as adjustment to new raw materials, will be made visible through this strategy. Technological similarities between Russian, Finnish and Norwegian materials and differences from the south Scandinavian materials, suggest movements of people in east-west direction as well as transmission of technological knowledge. Certain areas with the use of local raw materials like quartz and volcanic rocks are to some respect following the east-west traditions and as such seen as results prospecting for raw material and adjusting technologies to this new situation.

Kobayashi, Kenichi (Chuo University)

[291] *Impact of AMS Radiocarbon Dating on the Prehistoric Jomon Archaeology of Japan*

AMS dating has had considerable impacts on various aspects of Japan's Jomon archaeology, especially chronology and settlement archaeology. It shows that the time span of each chronological subphase based on pottery typology differs from one subphase to another. While one type of Middle Jomon Period pottery lasted some 70 to 80 years in the present western Tokyo Metropolitan Prefecture, another type of pottery in the same region of a different chronological stage only lasted 20 years. Such fine chronological control allows us to determine the contemporaneity of semi-subterranean residences within a settlement and among different settlements. This makes it possible to approach temporal change in population. Since 3300 cal BC, population in the present western Tokyo Metropolitan Prefecture region steadily and gradually increased for hundreds of years at a constant rate. After 2600 cal B.C., population declined drastically in 100 years. Population movement and natural disaster are considered as explanations of this rapid decline.

Koenig, Alan [86] see Arakawa, Fumiyasu

Koerner, Shannon (Colorado State University, CEMML) and Bretton Giles (Colorado State University, CEMML)

[264] *Evaluating Models of Prehistoric Landscape Choice in the Flint Hills Region of Kansas, USA*

The ongoing surge of geospatial computing applications in CRM archaeology has significantly expanded the capabilities of land managers to identify, evaluate, and protect cultural resources. Cultural resource management of military installations faces a unique challenge in landscapes that are actively used and modified, frequently as a result of military training activities. In this sense, compliance with cultural resource legislation on military installations is best served by geospatial technologies that enhance site detection and protection. Cultural resource management on the Fort Riley Military Installation in the Flint Hills region of eastern Kansas has been facilitated by a prehistoric archaeological site predictive model developed in 1998 by USACERL. The parameters used in this, now decade-old, model were based on existing geographic and prehistoric site location data. Archaeological survey and site testing on Fort Riley has in the intervening years has provided a more robust dataset to test and refine the original model parameters. This paper will reassess the old model and point out how it can be refined to more accurately reflect our current knowledge of prehistoric site distributions at Fort Riley Military Installation.

Kohler, Timothy [16] see Grundtisch, Katie

Kohler, Tim (WSU/SFI/CCAC), Stefani Crabtree (Washington State University) and Michael Berry (Dominguez Archaeological Research Group)

[106] *Secrets of the Southwest Solved by Walkative Tree Rings*

With appropriate cautions, tree-ring date distributions can provide proxies for human population size and rates of increase. Using the available corpus of tree-ring dates for the Southwest divided into a number of regions and time slices of varying length, we ask "what flows among which regions would best account for the distributions of tree-ring dates in each region?" Network analyses allow us to identify periods of relatively high, and low, flows, to characterize which regions are most connected at various times, and whether there is any sense in which some regions are more central than others. Our results will be compared with estimates of regional birth rates derived from an independent bioarchaeological proxy, Bocquet-Appel's 15P5 measure.

[161] *Discussant*

Kolar, Miriam

[180] *New Evidence for Ritual Sound Environment Use and Design at Chavín de Huántar, Peru*

Recent archaeoacoustics fieldwork at the 3,000-year-old Andean Formative Period ceremonial center at Chavín de Huántar, Peru has produced new physical dynamical evidence to characterize the site's ancient sound environment. We present findings from acoustic measurements of extant architecture, site-excavated sound-producing/musical instruments, and from tests performed on replica instruments in the exterior complex and its landscape setting. Our integrative methodology explores interrelationships among instrumental and environmental acoustics, and allows us to consider and test their human auditory perceptual implications. Results substantiate a new case for architectural acoustic use and design within a ritual framework.

Kolb, Michael (Northern Illinois University) and James Snead (California State Northridge)

[287] *Settlement Aggregation and the Built-Landscape in Hawai'i*

This paper examines archaeological data from Hawai'i in order to illustrate how supra-household community relationships become formalized in the built-landscape over time. As human populations

aggregate, they begin to enhance and formalize social relationships through the construction and manipulation of supra-household —institutions that help shape human behavior and synchronize human activities across space. Yet how exactly does the institutionalization process perpetuate itself over time? Results from Hawai'i indicate that certain forms of the built landscape, particularly temples and boundary markers, were instrumental in communicating and solidifying the social norms necessary for negotiating new forms of aggregated settlement.

Kolobova, Ksenia [222] see Flas, Damien

Komas, Tanya [92] see De Smet, Timothy

Kondo, Osamu [194] see Adachi, Noboru

Konsolaki, Eleni [288] see Gilstrap, Will

Konstantinov, Mikhail V. [222] see Izuho, Masami

Koon, Hannah (University of Bradford, UK)

[172] *Sea Sick: Development of a Proteomic Biomarker for Scurvy in the Bone Collagen of Early Seafarers*

By some estimates, scurvy killed or debilitated millions of early sailors prior to the discovery and subsequent recognition that vitamin C could ward off the deficiency disease. But the true extent of this scourge to sea-fares is difficult to prove because only the most severe and prolonged cases would produce pathological lesions on the adult skeleton. To complicate matters further many of the lesions that have been observed on archaeological specimens bear striking similarities to other metabolic disorders such as rickets and anemia.

This paper describes a new way to detect scurvy by focusing on collagen, the most abundant protein in the human body and the molecule at the heart of scurvy. Evidence of sub-clinical scurvy is determined from hydroxylation levels in bone collagen using peptide mass fingerprinting. The advantage of this high-throughput mass-spectrometric approach is that not only is it able to detect sub-clinical levels of scurvy, it only requires very small samples of bone collagen (>0.01mg) and is therefore minimally destructive.

Koontz, Cassandra (Vanderbilt University)

[50] *Maximizing the Molle: Multi-criteria Cost Surface and Cost Catchment Models for Wari Colonization of Coastal Arequipa (A.D. 600-1000)*

Archaeologists employ least cost analysis and site catchment models to predict human movement based on landscape characteristics and environmental variables in order to compare the energetic costs and benefits of travel to and interaction with various site localities. While traditional site catchment models assess site suitability based on selection parameters like resource availability, cost catchment models add LCA complexity, demonstrating travel costs and potential socioeconomic benefit at a site. During the Middle Horizon (A.D. 600-1000), the Wari Empire expanded from its capital at Huari (Department of Ayacucho) throughout the Majes, Siguas, and Vitor Valleys of coastal Arequipa, Peru. Wari expansion was motivated in part by the availability of land at elevations which supported the growth of *Schinus molle*, from which politically, ritually, and medically significant products such as chicha de molle were produced. This study compares cost paths based on slope and land cover classifications between Huari and newly surveyed sites in these three valleys. Furthermore, it uses cost catchment models to

assess site suitability based on land at elevations and ecological zones which support molle growth. Combined, these criteria provide a method for measuring the degree of potential articulation between Wari and sites targeted for imperial subordination.

Koopman, Annelies (MSc.), Henk Kars (Prof. Dr.), Sjoerd Kliuwing (Dr.), Simon Holdaway (Prof. Dr.) and Willeke Wendrich (Prof. Dr.)

[129] *Late Quaternary Climate Change and Egypt's Earliest Farmers: Geoarchaeology in the Fayum Basin*

Geoarchaeological research contributes to our understanding of why agriculture in Egypt was introduced four millennia later than in the adjacent Levant. Neolithic archaeological material in the Fayum Basin is exposed along today's hyper-arid northern palaeo-shores of Lake Qarun, controlled by seasonal and inter-annual climatic variations in the headwaters of the River Nile and in the Mediterranean Basin. Lithological field investigations and systematic sampling provide a high-resolution geomorphic framework for the study of the archaeological record. Analytical studies on sediment (grain size analyses, 'end-member modeling', CaCO₃-, organic contents), combined with dates on charcoal and sediment (AMS 14C, OSL), provide new data on geomorphic processes and source areas responsible for spatial-temporal variability of litho-types in the depression, controlled by palaeo-lake level oscillations and climatic changes. Large-scale spatial correlations between sediments, stratigraphy and archaeology are realized by integration of the geomorphological and archaeological datasets in a GIS-environment (ArcGIS 10). This systematic approach leads to a new methodology to study geomorphic contexts of archaeological records in the Eastern Sahara that can be applied elsewhere.

Kornblatt, Kristina

[217] *Reexamining the Role of Marine Fish in the Lowland Maya Diet*

The most widely accepted model of the Maya diet is one primarily of maize, legumes, and squash, fortified with protein from terrestrial sources. This model is applied to the vast majority of Mesoamerica with the exception of coastal sites, where marine resources were abundant and obviously exploited. While many studies have looked at the possibility of marine resources as a means of subsistence at inland sites, the conclusion is that the lack of faunal remains indicates that sites located further than 10 kilometers from the coast simply did not utilize the sea for nourishment. This paper will reexamine this conclusion by exploring a wide variety of indicators that marine resources, specifically bony fish, were likely utilized far beyond the coastal realm. From the early European contact reports to stable isotope analyses, this alternative look at the role of fish in the Maya diet raises many questions and has broader implications for the study of ancient Maya subsistence practices.

Korosec, Greg [131] see Keeler, Dustin

Kosciuk, Jacek [200] see Ziolkowski, Mariusz

Kosiba, Steve (University of Alabama)

[136] *A Recipe for Destruction: Food Offerings, Termination Rituals, and the Constitution of Authority during Inka State Formation (Cusco, Peru)*

As the Inkas declared their authority throughout the Cusco region, they demolished sacred shrines and places that had long been recognized as natural founts of political power. Pre-Inka houses were razed, canals were filled, and storage areas were decommissioned in a procedure seemingly bent on altering the very contours of everyday life. Reconstruction followed

destruction, however, as these ceremonial sites were reshaped according to monumental proportions, and consequently recast as definitively Inka places. This paper discusses the ritual practices that marked and manifested these dramatic changes. It focuses on the contents and contexts of food offerings at Wat'a, an ancient ceremonial center that the Inkas transformed during the initial process of state formation in Cusco. Positioned within the burnt vestiges of pre-Inka institutional spaces, food offerings—and the cooking and consumption practices that accompanied them—appear essential to the violent acts through which the Inkas redefined and incorporated this sacred place. In comparing these food offerings with faunal and botanical remains from households, the paper explores the political significance of quotidian and ritual consumption practices while providing a glimpse of the intimate rites through which local people fed and feted an ancestral place even as they labored to destroy it.

Kossyva, Aggeliki [288] see Burke Davies, Clare

Kotegawa, Hirokazu (Universidad Veracruzana)

[126] *Viajes de los olmecas: una perspectiva de los estudios de los monumentos olmecas*

Hay algunas investigaciones que nos muestran movimientos olmecas a lo largo del territorio mesoamericano y durante el periodo Preclásico por la evidencia de los materiales arqueológicos descubiertos en los sitios ajenos con su clara procedencia. Sin embargo, esta evidencia no es suficiente para confirmar movilizaciones olmecas, debido a que estos materiales se puede mover pasando a otros grupos contemporáneos como un asunto comercial. También sabemos que hay varios monumentos preclásicos con el estilo olmeca en distintas regiones mesoamericanas. Probablemente algunos de ellos son copias o imitaciones gráficamente de los originales del Golfo de México por gentes locales de cada región. Sin embargo, hay algunos monumentos que nos muestran la necesidad de presencia de los olmecas del Golfo o alguna persona que comprende bien su función y significado para la producción de ellos porque son difícil de trasladar en larga distancia por su tamaño y pesadez. Por ello, en la presente investigación, se analizarán los monumentos preclásicos de distintas regiones mesoamericanas y se mostrará una fuerte relación entre los olmecas del Golfo y la gente del Altiplano Central de México más que otras regiones.

Kotwasinski, Jill and John Richards

[25] *A Compositional Perspective on Ceramics from the 2011 UWM Excavations at the Aztalan Site*

Excavations in selected midden contexts at the Aztalan site (47JE001) in southeast Wisconsin produced a large ceramic inventory representing a mix of Late Woodland and Mississippian pottery types. Analysis of the recovered assemblage suggests a temporal span of ca. A.D 1100 to 1250. A portable X-ray fluorescence (pXRF) analyzer was used to collect compositional data on a sample of Late Woodland and Mississippian vessels recovered during the 2011 fieldwork. The pXRF analysis was designed to explore the degree to which clay resources may have been shared by the site's culturally diverse occupants. Results suggest that most vessels were manufactured from local clays.

Kouka, Ourania [288] see Kilikoglou, Vassilis

Koulakovska, Larissa [207] see Nigst, Philip

Koutsoumba, Despina [83] see Boyce, Joe

Kovacevich, Brigitte (Southern Methodist University)

[171] *Preclassic Maya Household Archaeology at*

Holtun, Guatemala

The archaeological site of Holtun is located in the central lakes region of the department of the Petén, Guatemala situated approximately 12 km south of the site of Yaxha. Holtun is considered a medium-sized civic-ceremonial center and comprises part of a group of epicenters located to the south of Lake Yaxha, all of which contain major architecture dating to the Preclassic period (600 B.C. – A.D. 250). While Preclassic monumental architecture is visible on the surface of the site (including an E-Group ceremonial complex and triadic platform), there is no immediate evidence of accompanying Preclassic period residential settlement. Following recent methodologies utilized by archaeologists working at other Preclassic period lowland Maya sites, 2011 investigations at Holtun focused on test units into major plaza floors associated with both Preclassic and Classic period monumental architecture. The methodology was a success and excavations revealed a number of Preclassic period residential mounds sometimes associated with Preclassic period architecture, but sometimes not. Material remains associated with these residences provide initial insights into activities associated with these mounds including feasting, shell production, and domestic ritual. While analysis and excavations are still ongoing, preliminary results and future directions for research will be presented.

[171] *Chair*

Kovacevich, Brigitte [204] see Crawford, Dawn

Kovacik, Peter [236] see Scott Cummings, Linda

Kowalewski, Stephen (University of Georgia)

[133] *It Was the Economy, Stupid*

Were the major cycles of growth and decline in Mesoamerican civilization (and by extension, other urban societies) caused by uncommon (in alphabetical order) aliens, droughts, eruptions, exhaustions, invaders, or raptures? Using data from >7000 km² of systematic survey covering 2000 years of urban society in highland Oaxaca, this paper reviews a theory of the ancient Mesoamerican economy and evaluates the hypothesis that common economic factors were largely responsible for times of growth and decline. Despite problems of archaeological specification, there is sufficient reason to develop this line of research, in which preindustrial urban societies are treated as subject not to exotic forces but to factors familiar to our own experience.

[231] *Discussant*

Koyiyumptewa, Stewart B. [67] see Hopkins, Maren

Kozierski, Ralph (UW-Milwaukee)

[151] *A Feast for the Spirit: The Dual Role of Bears and Canines in Meskwaki Society*

Between roughly 1680 and 1730, the Meskwaki, a farmer/forager society displaced from their homelands in what is now southeastern Michigan, settled along the Fox River Passage in eastern-central Wisconsin. Faunal remains excavated from the Meskwaki's principal settlement in this location revealed a robust subsistence system that effectively incorporated economically efficient subsistence foraging with the demands of the fur trade. Of particular note in the assemblage are the remains of bears and dogs. The two species appear to have been more important to the Meskwaki than to the Late Prehistoric populations who occupied the site before them. This study explores how the growing importance of these species would have satisfied economically optimal behaviors as predicted by behavioral ecologists, but also how both species had spiritual functions manifested in the archaeological and ethnohistoric records. By increasing the

harvest of bears and dogs the Meskwaki were effectively satisfying the needs of the body and of the soul.

[151] *Chair*

Krause, Johannes [172] see Bos, Kirsten

Kriebel, Sarah [68] see Walker, Morgan

Krigbaum, John [27] see Fitzpatrick, Scott

Krigbaum, John (University of Florida (Anthropology), George Kamenov (University of Florida (Geological Sciences)), Benjamin Valentine (University of Florida (Anthropology)) and Gary Aronson (Yale University (Anthropology))

[260] *Multiple Isotope and Trace Element Proxies to Infer Life History of Mid-Nineteenth-Century Human Skeletal Remains from New Haven, Connecticut*

Human remains recently recovered during construction at Yale-New Haven Hospital are now known to be associated with a mid-19th century Catholic Church cemetery. Based on historical evidence, these remains were likely interred between 1834 and 1851. Four individuals are known (A, B, B2, & B3) and their life history, etc. are reviewed elsewhere in this symposium. Our research uses methods of stable isotope biogeochemistry (IRMS, TIMS, MC-ICP-MS) and trace element analysis (ICP-MS) to assess each individual's life history. Data from bone and tooth tissues are analyzed for a light stable carbon, nitrogen, and oxygen isotopes as well as strontium and lead isotopes, and a suite of trace elements and rare earth elements (REE). Results of these multiple isotope and trace element proxies will assist our efforts in understanding who these people were, where they were from, and the nature of the lives that they led.

Krishnan, K. [147] see Costa, August

Krivoshapkin, Andrey and Kseniya Kolobova

[222] *THE Upper Paleolithic Site of Dodekatym-2 (Uzbekistan)*

Despite intense archaeological studies in the second half of the 20th century, our knowledge of the Upper Paleolithic in the northern part of Western Central Asia is far from adequate. Upper Paleolithic sites in the northern part of Western Central Asia are few, and their distribution is irregular. Most have no cultural layer. The scarcity of sites and finds is usually explained by depopulation in the 40–25 ka BP time range. Results of field work conducted by expeditions from the Institute of Archaeology and Ethnography SB RAS in Uzbekistan since 1998 suggest that even an arid climate did not prevent humans from settling in the piedmonts and at middle altitudes. Findings of five-year-long excavations at Dodekatym-2 along with those from Kulbulak and Kyzyl-Alma-2 and possibly from Shugnou have suggested a revision of traditional views concerning the Upper Paleolithic of the region, making it possible to reinterpret cultural parallels between the known Paleolithic sites in Uzbekistan. Artifact assemblages from these sites point to the microlaminar character of the Upper Paleolithic in the region. Technological and typological parallels suggest that a previously unknown microlithic industry existed in Western Central Asia.

Krotova, Oleksandra [116] see Julien, Marie-Anne

Krusekopf, Charles (Royal Roads University)

[31]

Discussant

Kryder-Reid, Elizabeth

[257] *Do the Homeless Have Heritage? Thinking Globally and Acting Locally in Indianapolis*

In an "Issues in Cultural Heritage" course team-taught by Larry Zimmerman and Elizabeth Kryder-Reid students explored issues related to the stewardship of cultural property on a local and global scale. As a way to apply these larger issues and concepts, the students were posed with the core question, "Do the homeless have heritage?" From there they were charged with developing interpretive materials and programming based on a long-term research project conducted by Dr. Zimmerman. Working in teams throughout the fifteen-week semester, the students produced two exhibits, a short book, a Facebook page, and a public forum. The project raised ethical, economic, legal, political, and pragmatic issues related to tangible and intangible heritage, and it increased their understanding of the practices and processes of cultural heritage management. But for some students the class was a "pedagogy of discomfort" (Zembylas and Vrasidas 2004), and it challenged their notions of the role of archaeology in the stewardship of the past. The experience gave the students a vantage point on the role of a community-engaged archaeology and the possibilities for a socially engaged practice that changed their perspectives on the stakeholders of heritage and spurred them to question the nature of heritage itself.

Kubicek, Ricky [25] see Picard, Jennifer

Kuckelman, Kristin (Crow Canyon Archaeological Center)

[16] *Slipping off the Bubble: Episodes of Ancestral Pueblo Population Movement in the Mesa Verde Region, A.D. 800 to 1300*

Population movements and the factors that stimulate them alter cultures in diverse and profound ways. Although farming formed a substantial and essential component of the subsistence base of the ancestral Pueblo communities in the Mesa Verde region, these populations were highly mobile. The vagaries of this drought-prone, high-elevation climate forced families to locate their settlements within the current but frequently-shifting farming belt, where adequate precipitation fell at the necessary times and the growing season was long enough for crops to mature. It was a precarious existence, and farmers were often "on the bubble." Excavations across the Mesa Verde region yield data that reveal repeated patterns of conditions and behaviors that immediately preceded population movements. Evidence of drought, crop failure, violence, or other strife is associated with widespread emigration from the Dolores River valley about A.D. 900, and the entire region in the mid-A.D. 1100s and the late 1200s. Recent excavations in the Ridges Basin area of the region have revealed evidence of a similar depopulation in the early A.D. 800s. This paper examines patterns of depopulation across the Mesa Verde region and the circumstances surrounding these crucial moments in Pueblo prehistory, when populations found themselves "slipping off the bubble."

[16] *Chair*

Kudaka, Masatomi [194] see Fukase, Hitoshi

Kuenstle, Justin (University of Montana), Anna Marie Prentiss (University of Montana), Kristen Barnett (University of Montana) and Mathew Walsh (University of Montana)

[196] *The Coarse Volcanic Rock Industry at Rio Ibanez 6, Aysén Region, Patagonian Chile*

Excavations at the stratified rockshelter, Rio Ibanez 6 (RI6), located in west central Patagonia, uncovered a previously unrecognized lithic industry featuring the production of a range of

tools from coarse volcanic rock (CVR) actually derived from the wall of the shelter. Tool forms from this material at RI6 include a variety of bifaces, projectile points, picks, knives, and wedges. This paper will present a description of the industry with a focus on production techniques and tool functions. Conclusions are drawn with a focus on relationships between patterns of lithic technology and those associated with food procurement and processing activities.

Kulisheck, Jeremy (Cibola National Forest and Grasslands), Anastasia Steffen (Valles Caldera Trust) and Connie Constan (Santa Fe National Forest)

[85] *Agricultural Intensification, Field Features, and Hypervisibility: A Case from the Jemez Mountains, New Mexico, USA*

Population density, with concomitant agricultural intensification, increased through the course of late ancestral and early modern Pueblo history in the USA Southwest. The proliferation of field features during this time span is one indicator of accelerating agricultural intensification. However, the relationship between the prevalence of these features and increasing population density is non-linear and non-uniform. Other factors responsible for the prevalence and distribution of field features are explored through the archeological record of the southwestern Jemez Mountains in north-central New Mexico, USA, for the time period AD 1150-1700. This record indicates that surface geology and geomorphology are primary determinants of where field features will appear under a regime of increasing population density and agricultural intensification. These findings reinforce the ideas that investment in labor rather than capital investment is a better measure of agricultural intensification, and that capital investments in fields are differentially persistent dependent upon materials available for construction.

Kuoha, Keoni (Papahanaumokuakea Marine National Monument)

[203] *Discussant*

Kurin, Danielle [38] see Sugimoto, Kassie

Kurin, Danielle (Vanderbilt University), Danielle Kurin (Vanderbilt University) and Emmanuel Gomez Choque (Universidad Tecnologica de los Andes (Peru))

[272] *Trepanation as Innovation: Experimentation and the Cultural Constraints of Cranial Surgery in Post-Imperial Andahuaylas, Peru (A.D. 1000-1250)*

This paper reports on the development of trepanation (ancient cranial surgery) in highland Andahuaylas, Peru, following the collapse of the Wari empire, ca. A.D. 1000/1050. Bioarchaeological analysis of crania demonstrates that trepanation emerged as a result of novel interactions with practitioners from other regions, as well as through trial-and-error experimentation. Standardization in trepanation techniques, sizes, and locations, suggest that practitioners shared a common understanding of how to perform cranial surgery, and that the bio-social factors that motivated trepanation were equally experienced throughout the region. While physical trauma seems to be the impetus for intervention in most cases of trepanation, other motivations may have included physiological or psychosomatic factors. Although not limited to select ethnic or cultural groups, trepanation may have been primarily reserved for men; this suggests that surgical intervention was mediated by gender within Andahuayan society. Results clearly point to technical innovations in the aftermath of the Wari empire, as well as distinct (though not intractable), culturally-informed understandings of how to heal an unwell body in the post-imperial past.

Kurnick, Sarah (University of Pennsylvania)

[197] *A Different View of Ancient Maya Politics: A*

Look at Political Strategies at the "Minor Center" of Callar Creek, Belize

Anthropological discussions of rulership frequently focus on the relationships between rulers and those who choose to obey them. Over the last several decades, archaeologists excavating at ancient Maya "minor centers" in the Belize River Valley have similarly emphasized the importance of communal engagement with the operation of political authority and have demonstrated the prevalence, during the Late to Terminal Classic period (AD 600-900), of corporate political strategies. Recent investigations by the Mopan Valley Archaeology Project at the site of Callar Creek offer a different vision of ancient Maya politics. During the Late to Terminal Classic period, the leaders at Callar Creek maintained their authority, not by emphasizing their ties with their followers, but by stressing their connections to their ancestors and to the nearby, larger center of Buenavista. This paper will examine how specifically the leaders at Callar Creek maintained their authority and will compare their political strategies to those used by the leaders of other, similarly-sized sites in the Belize River Valley. In doing so, the paper will underscore the importance of the past and of extra-local connections to the operation of political authority.

Kurota, Alexander [224] see Worman, F. Scott

Kus, Susan (Rhodes College)

[223] *Intimate Landscapes Past and Present: Commonsense/Knowledge, Poetic Deliberation, And Political Propaganda in Central Madagascar*

Can one adequately appreciate the nature of the concrete, palpable common sense knowledge that underpins trope and poetry used in philosophical and political reasoning in societies of primary orality? Raymond Williams' (Marxist) appreciation of "structures of feeling" and James Fernandez's (anthropological) appreciation of the power of tropes "to move us in quality space" can begin to help us understand the complex nature of the hegemonic struggle ("war of position" as Gramsci has referred to it) waged by "the state" at the site of local knowledge and belief in an oral society, such as that of 17-19th century Imerina in central Madagascar. I propose to examine how the private was indeed fodder for political propaganda in many official Merina royal oral traditions recorded in the mid to late 19th century. I will bring particular attention to the enduring love tale of Ramiangaly and her powerful paramour, Andrianampoinimerina, the most renowned of Merina sovereigns. I will focus attention on elements of gendered experiences of landscape of both intimate and dramatic detail. I am ultimately interested in an ethnoarchaeology of local material and metaphorical poesis that might be put into service in the confrontation of hegemonic droning of the elite.

[223] *Chair*

Kusimba, Chapurukha (Chicago Field Museum)

[15] *The African City: Yoruba and Swahili Urbanism*
African cities were centers of economic activity, loci of political and ritual authority and militarism. However, compared to other regions most towns and cities in Africa remained small, were associated with rulers and had brief life spans. They tended to be relatively discrete entities that were surrounded by a peri-urban zone from which they drew most of their basic resources. Mapping boundaries that separate urban from rural zones continues to be archaeologically elusive. However, ethnographic research shows daily life in urban and rural settings often shaped nature and mode of interactions. For example, the Yoruba and Swahili, who are perhaps the most urbanized peoples in sub-Saharan Africa, developed and in some cases, invented complex means to distinguish themselves from their rural kinsmen. My paper will draw from Yoruba (West Africa) and Swahili (East Africa) examples to discuss current knowledge about early urbanism in Africa, including factors influencing the growth, size, and location. What are the similarities and differences in the

formation processes of urbanism and urban cultures in Africa? I will also discuss strategies employed by economic and political elites to control demand and supply channels of goods and services that were the life-force of life in the city.

Kwanwisiwma, Leigh

[67] *Discussant*

Kvetina, Petr (Institute of Archaeology Prague, Czech Republic)

[185] *Virtual 3D Museum of Neolithic Culture*

The aim of the project is to apply 3D scanning technology to create a virtual museum providing a picture of the European Danubian Neolithic culture, based on the example of the settlement in Bylany (Czech Republic), dating from the 5th – 6th millennium B.C. The main parameter of the described project is to set up a methodology for recording and presenting archaeological finds digitally. The basic technology is optical 3D scanning of artifacts that exactly reflect the 3D surface geometry and will bring new presentation possibilities. Acquired digital records can also serve as well as for research and educational purposes on all academic levels. The project's most important output consists in a virtual museum on the web of the Neolithic settlement area. Moreover, the open library of 3D scans will integrate a thematic GIS map of the area. GIS of the settlement area of the archaeological site in question and virtual reconstruction of different types of immovable heritage (longhouses, circle enclosures, settlement dynamics) form part of the project. The purpose of the project is also to strengthen the local community engagement and to emphasize the worldwide importance of the digital heritage management.

Kvetinova, Sylvie

[268] *Material Culture as a Vehicle of Social-Political Organization: Chimu Pottery*

The wealth of characteristic Chimu blackware pottery in most Americanist museums worldwide usually derives from centuries-lasting looting of archaeological sites on the Peruvian North coast. The resulting lack of archaeological context, the relative low attractiveness of Chimu pottery in terms of technological execution and iconographic diversity, and perhaps also its abundance condemned Chimu ceramics to museum depository shelves. Quantitative and qualitative analysis of 1832 ceramic vessels deposited in the Ethnologisches Museum in Berlin, Germany, disclosed differences in morphometric parameters among the particular vessel types. Although chronological perspective could not be analyzed in detail, the most morphologically standardized vessel categories correspond to Inca derived types, therefore attesting for increased state supervision of ceramic production in Chimu – Inca times, as also supported by the surveyed Chimu – Inca pottery workshops. While no archaeological evidence is so far available for the Chimu fine pottery production, it seems to be less metrically homogenous, but richer in figurative iconography. Arguably, in both societies pottery represented means of socio-political domination, but Chimu potters stressed more the social dimension in depicting wealth of natural and supernatural motifs, while the Inca were more into their political presence imprinted in new vessel shapes.

Kwak, Seungki, Ben Marwick and Dan Nelson

[7] *Tracing Prehistoric Subsistence: Application of Organic Geochemical Analyses on Potsherds from Ancient Korean Peninsula*

This study investigates prehistoric human subsistence in Korean peninsula using organic geochemical analyses on potsherds. While other approaches are focusing on reconstructing the ancient pot function such as use-wear analysis and ethnographic studies, organic geochemical analyses on archaeological ceramics

endeavor to be precise about types of food groups that was cooked or stored within a pot by attempting to isolate and identify the specific organic compounds trapped in the fabric of its wall. Since organic compounds are often preserved in direct association with archaeological ceramics, organic geochemical analyses have become an important method of investigation which archaeologists use to better understand the function of ceramic artifacts and local diets. The direct examination of the remains of resources in the Korean peninsula is focused on shell middens, because the high acidity of sediment does not allow long-term preservation of bone or plant remains. Therefore, organic geochemical analyses could be the most suitable method in this setting. This research will provide a unique chance to understand ancient subsistence through the direct examination of potteries: the most wide-spread material culture in the prehistoric Korea.

Laak, Emily (University of Wisconsin-Milwaukee), David Stock (University of Wisconsin-Milwaukee), Alexis Jordan (University of Wisconsin-Milwaukee) and Jacquelyn Bluma (University of Wisconsin-Milwaukee)

[40] *Fractured Pasts and Brittle Bones: Another Look at Two Mid-Nineteenth-Century German Cemeteries of Southeastern Wisconsin*

During the 1980s the skeletal remains of 24 individuals were disinterred from the Altenburg Lutheran Church Society Cemetery and the German Evangelical Lutheran Cemetery (Stoltz Cemetery) in Mequon, in southeastern Wisconsin. The majority of these individuals were interred in the mid-Nineteenth century, at the time German populations were becoming well-established as a major cultural and ethnic force within the region. Analyses of the human remains from the cemetery reveal a number of fractures and evidence for multiple pathologies. Through a comparison of the bioarchaeological data with larger patterns of German immigrant lifestyles, we examine the likely causes of fracture and pathological trends.

LaBelle, Jason (Colorado State University)

[116] *Hunters of the High Country: Exploring Variation in the Complexity and Ages of Game Drives in the Colorado Alpine Tundra*

Rock walls and hunting blinds were identified in Colorado as early as the 1860s, yet detailed studies of them did not begin until the 1960s, with Jim Benedict's pioneering work at the Murray Game Drive. Over the following four decades, Benedict went on to identify dozens more, focusing on the dating of the features through rock weathering, lichenometry, and radiocarbon dating of charcoal from blinds. The dated sites range from late Paleoindian to Protohistoric in age, with the majority dating to the last 2000 years. The sites also vary in size and complexity, ranging from expedient single use forms to complex accretions of walls, blinds, and pits located along seasonal game migration routes. As of 2012, seventy hunting sites are known from elevations above 3000 m in Colorado, with most found along the Continental Divide. This presentation summarizes variation in these systems, focusing on their construction complexity as reflected in the size and diversity of architectural forms and breadth of temporal occupation. The location of these sites, coupled with the dominance of late prehistoric ages, suggests the powerful role that communal hunting played concomitant with the emergence of cultural complexity along the Colorado Front Range between A.D. 150 and 1150.

LaClavetine, Kilian [252] see Ruvalcaba, Jose

Ladefoged, Thegn (University of Auckland) and Michael Graves (University of New Mexico)

[255] *The Evolution of Social Complexity in Polynesia: How Patrick Kirch Transformed the Study of Prehistoric Development*

While cultural evolutionists promoted the comparative advantages enjoyed by the study of social complexity in Polynesia, it remained for Kirch to show how archaeologists could contribute to this important anthropological topic. He did so by conducting original research in several areas (e.g., Hawaii, Society Islands, Tikopia, and Tonga); synthesizing at a grand scale the work of anthropologists, linguists, historians, paleoecologists and other archaeologists; and tacking back and forth between processual and historical theoretical frameworks. Drawing on his most recent and comprehensive effort to understand archaic state formation in prehistoric Hawaii, we illustrate Kirch's accomplishments and suggest avenues for future research.

Lady, Belinda M. [124] see Carmody, Stephen

Laffoon, Jason (Leiden University)

[254] *Human Paleomobility in the Circum-Caribbean: New Insights from Isotope Analyses*

This paper will focus on patterns of human migration and mobility in the ancient Antilles as inferred from isotopic evidence. New data from a long-term, inter-disciplinary, international research project investigating human paleomobility from a Circum-Caribbean perspective indicate that human migrations occurred at varying scales: intra-island, inter-island, and mainland-island. This research represents the first macro-regional assessment of strontium isotope variation in the Caribbean biosphere and the largest comprehensive study of strontium and oxygen isotope variation amongst human skeletal materials in the Antilles. The integration of these isotope results with archaeological, bioarchaeological, mortuary, and dietary data sets permits comparative analysis of local and migrant groups, and the exploration of individual geographic origins. The main findings of this study will be presented and discussed in reference to current models of prehistoric human migrations in the Caribbean with specific reference to the size, demographic structure, status, and possible origins of individual migrants.

Laguens, Andres [14] see Alberti, Benjamin

Lail, Warren (New Mexico Highlands University) and John McCray

[85] *Mycotoxins, Maize, and Site Abandonment in the American Southwest*

Recent studies have confirmed the presence of certain molds and mycotoxins in maize. Fusarium verticillioides produces fumonisin B1, which has been linked to esophageal cancer and neural tube defects in humans. Zearalenone produced by Fusarium graminearum has been shown to have estrogenic effects on swine and other mammals resulting in reduced fertility rates. Our research analyzes samples from the northern Rio Grande region to identify the types of molds and mycotoxins present in traditionally grown maize. Comparing climatic data from the 1300s, we hypothesize that climatic and environmental conditions affected not only the quantity and nutritional value of maize, but the toxicity of the maize itself. We explore the potential effects mycotoxins could have had on ancient populations in terms of neural tube defects, cancers, and lowered fertility rates. We conclude that mycotoxins might have played a contributory role in population decline and site abandonment in certain regions of the prehistoric American Southwest.

Lail, Warren [267] see Evans, Victoria

Lailson Tinoco, Becket (CCSyH-Universidad Autónoma de San Luis Potosí), Jorge Balamaseda (IIM-Universidad Nacional Autónoma de México), Luis Felipe Del Castillo (IIM-Universidad Nacional Autónoma de México), Niklas Schulze (CCSyH-Universidad Autónoma de San Luis Potosí) and Ana Pelz (Instituto Nacional de Antropología e Historia)

[234]

Primeras aplicaciones de datación por rehidroxilación en materiales arqueológicos de México

La datación por rehidroxilación en materiales arqueológicos, es una técnica arqueométrica que se basa en el hecho de que las cerámicas, adobes, ladrillos o materiales cocidos de barro adsorben y comienzan a reaccionar químicamente, con la humedad atmosférica al término de su cocción. La reacción química resulta en una rehidroxilación de la arcilla. Este proceso continúa a una razón proporcional a $t^{1/4}$, donde t es el tiempo. La rehidroxilación provoca un incremento de masa. Conociendo el grado de rehidroxilación de la muestra y la razón de rehidroxilación es posible determinar el tiempo transcurrido desde la cocción. Es de destacar que en las investigaciones realizadas se ha probado que la constante cinética depende de la temperatura y no de la humedad relativa, siendo la temperatura media la única información auxiliar, necesaria para calcular la edad de la muestra. En este trabajo se presentan las primeras aplicaciones, de la técnica de datación por rehidroxilación, en materiales cerámicos y de barro pertenecientes a sitios arqueológicos de México, tanto informando sobre el comienzo de desarrollo y experimentación de la técnica, como sus avances en materiales de sitios del centro y de la frontera septentrional de Mesoamérica.

Lailson-Tinoco, Becket [17] see Solis-Pichardo, Gabriela

Laluk, Nicholas [64] see Altaha, Mark

Laluk, Nicholas (White Mountain Apache Tribe - U of A - CNF)

[169] *Traces of the Past and Paths to the Future: Fostering Collaboration in Land Management*

Despite more than one hundred years of exile, Chiricahua, Mescalero and Western Apache groups still retain significant and powerful ties to their traditional lands in what is now southeastern Arizona. Land managers and researchers are beginning to recognize the value of integrating traditional knowledge with science-based practices to develop a more holistic cultural heritage resource preservation practices. Today, legislation and policy requires federal land-managing agencies to consult with Tribes, potentially ushering in a new age of inter-ethnic communication, cultural collaboration, and environmental justice. Therefore, this presentation will discuss the challenges of ethnographic, and field research as well as issues in reference to effective integration of Apache values, expressions and perspectives into long-term and contemporary preservation, on-the-ground land management and ecosystem restoration strategies. Moreover, the creative and practical integration of traditional knowledge Apache natural environmental and cultural heritage resource best management practices will assist various stakeholders to better preserve, respect and protect the environment and ecosystem as co-stewards of the land base.

Lam, WengCheong (Harvard University Department of Anthropology)

[216] *Trade, Market-Exchange, and Iron Artifacts in the Xianyi (Southwestern Barbarians) Societies*

Trade is one of the topics that attract most archaeologists' attentions recently. Nonetheless, its identification from archaeological records is still very hard, if not impossible. Hirth proposed a model twelve years ago called "household distributional model" which holds promises to further explore this issue. This model proposes that homogeneous inventory from household units representing different ranks can serve as an indicator of marketplace exchange. Political background, however, should not be ignored when we try to employ this model to understand redistribution and exchange. My case study focuses on the distribution patterns of iron objects from the "southwestern barbarian" societies in Southwest China during the Warring States and Han Dynasty and the mechanisms underlying the circulation

of iron artifacts. Several sources of evidence show that the distribution of iron objects might have followed mechanism similar to the "household distributional model" but still was tightly related to elite's involvement. In order to further substantiate this heuristic tool, I suggest that the political context of marketplace exchange and centralized redistribution be further differentiated.

Lamb, Celine

[210] Domestic Vegetated Spaces at Cerén, El Salvador: An Ethnoarchaeological Approach
The study of domestic vegetated spaces can address both domestic economies and agricultural practices of the ancient Maya. Numerous scholars assume the existence of "orchard gardens" during the Classic period, yet most of these postulates are based on ethnographic and ethnohistoric analogy. This prevailing concept is confronted by the present ethnoarchaeological study using data from Cerén, El Salvador, the only site providing direct archaeological evidence of such vegetated spaces in the Maya realm. Present-day communities demonstrate high diversity in the forms and secondary functions of these spaces, characteristics that are often underestimated by archaeologists. This diversity can be correlated with household specialization, which has been observed in the archaeological record at Cerén. Modern domestic vegetative spaces of Joya de Cerén have provided useful insight for interpreting archaeological remains, but should in no case be assumed as static "relics" of past agricultural practices. With increasing awareness of the structural and functional diversity of these vegetative spaces, the development of an explicit set of terminology will facilitate discussing the complex socio-economic roles of domestic land use patterns.

Lamb, Céline [210] see Heindel, Theresa

Lamberg-Karlovsky, C (Peabody Museum)

[157] *Discussant*

Lambert, Patricia (Utah State University)

[177] *Discussant*

Lambrides, Ariana (University of Queensland) and Marshall Weisler (University of Queensland)

[263] A Critical Assessment of Protocols for Identifying Archaeological Fish Remains: The Use of Vertebrae and Its Contribution towards Improving Subsistence Studies in Oceania
Fish were a vital protein source for Pacific cultures and fish bones are usually the most ubiquitous vertebrate faunal class in Oceanic archaeological sites. Protocols are getting more detailed by adding new elements used for identification to taxon. We contrast the contribution of different fish bone identification protocols towards documenting fish species richness and diversity by: (1) using only the commonly used five-paired cranial bones (dental, premaxilla, maxilla, articular, and quadrate) and "specials" (e.g., unique anal and dorsal spines, unusual vertebrae, scutes, etc); (2) to more recent efforts that expanded the number of paired cranial bones (e.g., opercle, palatine, hyomandibular); and most recently (3) the inclusion of all vertebrae. Screen size and taphonomy are important considerations when determining the most useful bones for identification as element preservation is not consistent across fish families and using primarily cranial bones and "specials" restricts relative fish species abundance. We developed explicit identification and quantification protocols for systematically using all vertebrae and contrast the results with different identification procedures currently used. Using a well-preserved fish bone assemblage from Henderson Island, Pitcairn Group, southeast Polynesia, we demonstrate a change in rank-order abundance

across three identification protocols which has implications for reconstructing prehistoric marine subsistence practices.

Lamoureux St-Hilaire, Maxime (Tulane University)

[65] Living Amongst Ruins: The Use and Perception of Abandoned Architecture at Minanha, Belize

Abandoned landscapes have powerful semiotic values which variably affect different types of agents. Sedentary households surrounded by abandoned architecture would have had many ways to conceive this abandoned/occupied dichotomy. Commoners who settled near abandoned domestic and ceremonial structures – whether humble or elite – were aware that their current state of settlement may have to be seriously altered. The ancient Maya city-state of Minanha, Belize, was gradually abandoned over a period of three centuries. Indications are that Minanha's elite epicenter was first abandoned, early in the Terminal Classic (ca. 810 AD), while several non-elite household groups remained living around that area for centuries. Several burials were placed in site core groups after their abandonment, and Postclassic (900-1200 AD) ceramic sherds were retrieved from site-core locations. This paper investigates the identity and motives of the agents who buried their dead in these loci, and revisited the functions of this vacant constructed landscape. We suggest that remaining inhabitants from the surrounding hinterlands reused the abandoned administrative and religious elite site-core for mnemonic and ritual purposes. This paper further contrasts the use of this vacant monumental site-core by these agents with their management of the surrounding, omnipresent abandoned commoners' households.

[65] *Chair*

Lamoureux St-Hilaire, Maxime [65] see McAnany, Patricia

Landau, Kristin [144] see Gonlin, Nan

Landau, Kristin (Northwestern University)

[166] Spatial Logic and Maya Site Planning: The Case for Cosmology

The anthropology of space and place has gained much from an increased reliance on archaeological literature, as well as the closely related field of geography and empirical geographical information system (GIS) analyses. Because we shape and are shaped by the landscape, thoughtful consideration of spatial relationships should help us develop, evaluate and refine our conceptions of social relations. In this paper I build on recent discussions of ancient Maya site planning principles through the application of models based on efficiency maximization (mean center, least cost paths) as well as those derived from Maya cosmology (elevation, viewshed). I test these models on the neighborhood scale at the site of Copán, Honduras, to better understand principles behind the planning of paired groups. Whereas efficiency-based models did not offer any insight into urban design, it seems likely that ancient residents of Copán planned their communities according to potent symbolic belief systems. Results are in keeping with Wendy Ashmore's (1991) paper on concepts of directionality among the ancient Maya, and particularly with the significance of north and salience of a north-south building axis. Through systematic and comparative spatial analyses, this paper empirically supports cosmological models of Maya site planning.

Landon, Amanda

[206] Archaeological Site Distribution in the Telegraph Flat and Fivemile Valley Areas of GSENM

This paper reports the results of a landscape-level analysis of geographic information systems (GIS) and other spatial data that

has been collected over the past 70 years in the Telegraph Flat and Fivemile Valley areas of the Grand Staircase. A total of 495 components representing 465 archaeological sites have been recorded on this flat expanse through 32 survey projects that cover 19.4% of the ground surface. Of the sites, about 68% fall within surveys, and the rest were recorded during very early inventories or more recent, informal reconnaissance work. Patterns that may reflect a prehistoric movement toward soils and landforms better suited to agriculture--as well as in situ development of the Virgin Anasazi cultural tradition from earlier Late and Terminal Archaic traditions--emerged when the archaeological site data were overlaid on United States Geological Survey (USGS) soils and landform data.

Landt, Matthew and Neil Hauser (ATSA, Denver, CO)

[33] Sourcing Bridger Chert Using LIBS

Lithic material from over a dozen Bridger chert quarries in northwest Colorado and southwest Wyoming were sampled to determine if there were elemental differences that could be utilized as discriminates at intra- and interregional scales. Laser Induced Breakdown Spectroscopy (LIBS) was used to obtain spectra, emission versus wavelength, from the quarry samples for investigating approaches for discriminating between the quarries. By using a small number of laser shots at one location, the LIBS approach allows material beneath the rind to be examined while only removing a microscopic amount of material.

Due to the inhomogeneity of the materials, 300-500 spectra from hand samples from each quarry were used to develop signatures for each quarry. Several different methods including discriminant analysis, occurrence statistics, and spectral vectors were used to develop and compare signatures and determine how well they allowed discrimination between the quarries. This methodology could also be applied to artifacts to associate their constituent material with particular quarries, thus informing on mobility and interactions of those using the material.

Lane, Rachael (University of Sydney)

[49] Morality, Knowledge of the Past, and Difference Theory

This paper discusses the moral implications of the knowledge of the past through the case study of low-density urbanism. Difference theory uncouples the problematic binary of the social and the material to offer a logical basis for approaching the morality of our knowledge of the past. Urban planners and historians of the recent past with a short-term time view, tend to be of the opinion that low-density urbanism is a consequence of mechanized transport and that key questions concern whether low density urbanism is desirable or a problem; and whether should we keep it or get rid of it? If low-density urbanism had never existed previously, one might view it as transient and something we could remove relatively quickly. But, if we know that it existed in the pre-industrial world, for centuries, as for example at Angkor, then it is not something we are likely to get rid of so easily.

Decision making about the future of human societies cannot risk neglecting the potential importance of the more distant material past. What one knows about the past has some significance for the future.

Lane, Brent and Brian Billman (U. of North Carolina at Chapel Hill)

[209] More than Research and Teaching: Examining the Social and Economic Impacts of Archaeological Field Schools

Archaeological field schools have been central to the mission of universities throughout the Americas since the inception of archaeology as an academic discipline. For over 100 years, field schools have funded research for professors and provided essential training for students. However, field schools can and must be more. They can be a catalyst for social change. Here we examine the socioeconomic impacts of the MOCHE-UNC Field

School in South America on local communities in northern Peru since its inception in 1998. We propose several best practices for amplifying the positive social and economic impacts of field schools on stakeholder communities.

Lane, Brian (University of Hawai'i) and Beau DiNapoli (University of Hawai'i)

[274] Preliminary Thoughts on a Shortened Chronology for East Polynesia

The recent reappraisal of the radiocarbon record for East Polynesia indicates a recent and rapid colonization of the region around the 13th century A.D. This dramatic reduction in the settlement history for East Polynesia calls for a reevaluation of the current narratives concerning the mode and tempo of biotic, landscape, and cultural changes following colonization. These perspectives are often laden with assumptions of relatively gradual processes. The shortened prehistory for the region has important implications in many archipelagos for population growth, social organization, agricultural intensification, landscape modification, and impacts on island ecology. Often these impacts necessitated unique cultural responses to the altered settings. These implications are reexamined through the lens of a shortened chronology and models from human behavioral ecology. This new perspective is characterized by the potential for immediate and profound impacts on island environments following colonization and a range of human responses to constantly changing circumstances.

Langenwalter, Paul (Biola University, La Mirada, CA)

[280] Prehistoric Vertebrate Animal Use at 50-Oa-B01-20, a Rockshelter in North Halawa Valley, Oahu, Hawaii

50-Oa-B01-020 consists of approximately 50 cm deep midden, situated inside and in front, of an approximately 6x8 m² rockshelter located about 5 kilometers inland of Pearl Harbor in the North Halawa Valley, Oahu, Hawaii. The prehistoric assemblage includes stone artifacts, shellfish, bone and plant materials, including kukui nut shells. The site appears to have been intermittently occupied as a base for local resource procurement. The presences of adzes in the assemblage suggest that wood cutting was an important activity associated with the site. A sample of 64 vertebrate specimens was recovered during the excavation. The vertebrate assemblage includes fish, birds and mammals. This assemblage provides evidence of limited vertebrate use, resource procurement areas, local paleoenvironment, and butchering. Fish species dominate the assemblage. Two of three avian species are indigenous and extinct. The third, red jungle fowl, was an early human introduction. The primary mammalian species are dog and pig, which were a significant source of the meat consumed at the site. The assemblage reflects a focus on fishing although the mammals were significant contributors of biomass. One specimen was cut using an adze or similar tool.

Langlitz, Meredith [91] see Thomas, Ben

Langlitz, Meredith (Archaeological Institute of America) and Ben Thomas (Archaeological Institute of America)

[269] National Archaeology Day: Creating an Archaeological Network for Public Engagement

National Archaeology Day, an annual event organized by the Archaeological Institute of America and celebrated for the second time in October 2012, underscores that archaeology is everywhere and is accessible to all. The scope of this international event raises the profile of archaeology within modern society by engaging the public in interactive activities within their communities. National Archaeology Day is also an opportunity for archaeological organizations around the world to collaborate and promote a greater understanding of the discipline. This poster reports on the growth of National Archaeology Day from 2011 to 2012, shares data collected from participating groups, and

explores ways to continue to increase the scale and impact of this major public archaeology program.

Lanoë, François (University of Arizona), Stéphane Péan (Muséum national d'Histoire naturelle) and Alexandr Yanevich (Ukrainian Academy of Sciences)

[69] *Subsistence in Crimea during the Younger Dryas: A Case Study: Buran-Kaya III Rock Shelter*

Buran-Kaya III is a rock shelter and archaeological site located near the village of Aromatne, in the Bilohirsk region of the Republic of Crimea (Ukraine). Archaeological layers range from the Middle Palaeolithic to the Middle Ages. In this study, we investigate the faunal remains of layer 4, attributed to the Swiderian culture (Final Palaeolithic). The taphonomic and zooarchaeological analysis of the 4,028 specimens show the primary role of human processes in the constitution of the assemblage. Diet was essentially based on medium-sized mammals; among them, the saiga antelope is the most represented taxon. The subsistence strategies developed by the Swiderian people at Buran-Kaya III show an adaptation to a steppic biome. Exploitation of the landscape and of the available resources varied seasonally, probably to a larger geographic extent than the Crimean mountains. Our study gives new insights on subsistence patterns of hunter-gatherers in southeastern Europe at the very end of the Pleistocene.

Lanoë, François [183] see Wismer-Lanoë, Meredith

Lape, Peter [167] see Peterson, Emily

Lape, Peter (University of Washington)

[232] *Discussant*

Lara , Israel [91] see Fenoglio, Fiorella

Lara Barajas, Israel (INAH) and Fiorella Fenoglio Limón (INAH)

[91] *Protección del patrimonio cultural y procuración de justicia*
En México, es relativamente frecuente la localización fortuita de restos óseos humanos antiguos o recientes y se requiere de la participación de los órganos legales del Estado para su investigación. Por lo general, el Ministerio Público (MP) solicita la intervención de distintos Peritos, pero no cuentan con especialistas en Antropología y/o Arqueología Forense para las labores de recuperación de datos en el lugar de la investigación. La participación de Antropólogos o Arqueólogos es fundamental para la recuperación de restos óseos en campo, para la obtención de los indicios que se perderían si la excavación no se realiza sistemáticamente y para su posterior análisis en laboratorio. De igual modo, la presencia de especialistas en la materia permitiría la determinación de la competencia: si se trata de restos prehispánicos delegar la responsabilidad al INAH para su recuperación, con lo cual, se evitaría la destrucción de los contextos arqueológicos. En el INAH Querétaro hemos atendido diferentes casos donde la intervención del MP ha provocado la destrucción de los contextos arqueológicos, lo que nos ha llevado a trabajar de manera interdisciplinaria con los órganos de procuración de justicia para solventar estos hechos.

Larmon, Jean (Washington State University), John G. Jones (Washington State University) and Hector Neff (California State Long Beach)

[207] *The Pacific Coast of Guatemala: A Palynological Exploration of Population and Climate Change during the Middle and Late*

Formative Periods

In this poster, I discuss the detailed analysis of a sediment core extracted from Iztapa/San Jose on the Pacific Coast of Guatemala. Core IZT09-1 provides insight into the paleoclimatic conditions and agricultural and cultural intensification on the coast during the Middle and Late Formative periods. Fossil pollen within the core is well-preserved and includes cultigens, such as Mays and Cotton pollen, that indicate a clear human presence in the area. Other pollen taxa that indicate human occupation, cultivation, and the selective clearing of forests are also common in the core. Coupled with soil chemistry data, isotopic studies and charcoal counts, the pollen data from core IZT09-1 acts to bolster the timeline of human occupation and climate change on the coast.

Larsen, Clark Spencer [6] see Swisher, Kimberly

Larson, Greger (Durham University), Keith Dobney (University of Aberdeen), Ophelie Lebrasseur (Durham University), Rick Knecht (University of Aberdeen) and Phil Piper (Australian National University)

[20] *Dog Domestication and Human Dispersal*

Research into early animal domestication has now broadly established the geographic and temporal origins of the major livestock species. Dogs remain an enigma, however, not only because they were the first domestic animal and the only domesticate whose appearance precedes the emergence of settled agriculture, but also because decades of archaeological and genetic research have failed to reveal where and how many times dogs were domesticated. Establishing the origins of dogs is critical given their standing as the first domesticate. Knowing how, when, and where dog domestication took place will provide new insights into the shift from hunting and gathering to farming, one of the most significant steps in human history. This paper presents preliminary DNA data from modern and ancient dogs from a wide variety of contexts in Island Southeast Asia, Alaska, and the Caribbean in order to assess the number of independent wolf populations that were domesticated and their human-mediated dispersal routes.

[20] *Chair*

Latham, Krista (University of Indianapolis Archeology & Forensics Lab) and Stephen Nawrocki (University of Indianapolis Archeology & Forensics)

[193] *Forensic Archaeology: Identifying Important Skill Sets for the Controlled Recovery of Human Remains in Outdoor Contexts*

Forensic anthropologists are recognized as experts in skeletal analysis and human identification. However, many forensic anthropologists have been trained broadly in multiple subfields, including archaeology. The recovery of decomposed human remains from outdoor settings requires a unique skill set not often obtained by crime scene investigators during their training. We will discuss five major skill sets that are necessary to conduct controlled field recoveries. First, human bone and soft tissues must be identified and inventoried. Second, an understanding of soil stratigraphy is essential in the search for clandestine graves and the exclusion of irrelevant areas from continued investigation. Third, training in the techniques of controlled archaeological recovery is crucial for minimizing damage to the remains and maximizing evidence recovery. Fourth, recognition of evidence, such as plants and insects that can link a suspect to the crime scene or help to estimate the postmortem interval, is necessary. Finally, one must interpret phenomena that alter the crime scene through time, including scavengers, water action, and agricultural practices, so that the final distribution of remains and evidence can be understood. Extending anthropologists' established expertise in field recovery techniques into the forensic realm can significantly improve the quality of death investigations.

Lattanzi, Gregory (New Jersey State Museum) and Matthew Boulanger (University of Missouri Research Reactor)
[62] *pXRF Analysis of Middle Woodland Mica Artifacts from the Abbott Farm National Historic Landmark*

Archaeological investigations at the Abbott Farm NHL have produced thousands of artifacts dating to the Middle Woodland Period. These include mica sheets recovered from pits and general contexts, some of which show clear signs of cutting and drilling. Here, we use pXRF to examine artifacts and geological mica specimens in an evaluation of the suitability for non-destructive provenance studies of mica artifacts. Typically associated with Middle Woodland Hopewell sites throughout the midwestern United States, the chemical characterization of mica artifacts will help in understanding the exchange of this material not only within the Middle Atlantic but adjoining regions as well.

Lau, George (Sainsbury Research Unit, University of East Anglia)
[19] *Intermediality and the Recuay Style (A.D. 200-600), North Highlands of Peru*

Why do people make things in distinct "media" that look alike? If pottery ranks among humankind's most malleable of technologies – ready for unbridled innovation and creativity – it is curious that, in ancient Peru's Recuay tradition, it is so marked by its formal relations, especially resemblances, to other kinds of elaborate objects fashioned from different materials. Key examples are examined to demonstrate that mimesis in Recuay pottery often found inspiration in the shapes of stone, gourd and fleshly bodies, or vice versa. Objects with shape resemblances (and functions?) were then made more similar by clothing their surfaces with designs and techniques of weavings. The paper argues that the intermediality of Recuay pottery operated as a fundamental part of the aesthetics and making of noble persons.

Lau, Michelle, Dan Contreras, Nico Tripcevich and Yuri Cavero
[220] *What to Make with So Much Obsidian?*

The results of the 2012 three-month field season at the Quispisisa obsidian source found evidence of the largest prehispanic obsidian quarrying activities known in South America. How to cope with this much material was our first task for analysis. A sampling strategy that targeted diagnostic artifacts was employed. The analysis was designed to measure both quantitative and qualitative artifact attributes. Preliminary results from a sample of the surface survey collections and excavations at the Jicha Parco quarries and the nearby Marcamarca settlement provide the crucial evidence for understanding what reduction activities were occurring at the obsidian source and in domestic contexts over time. The results permit comparisons with existing regional typologies but also enable further quantitative statistical analyses and better inter-assemblage comparisons. Analysis from both excavated and survey contexts allow for inter-site comparisons at Jicha Parco and Marcamarca, while a selection of excavated loci at both sites permits spatial and temporal intra-site analysis, particularly the examination of how much lithic technology changed over time. Future studies will benefit from the quantitative artifact data drawn from this diagnostic quarry sample which may be used for comparisons on a much larger geographical scale.

Lauer, Adam [27] see Kadohiro, Karen

Lauer, Adam (University of Hawaii at Manoa), Tianlong Jiao (Department of Anthropology, Bishop Museum, Honolulu) and Guoping Sun (Department of Archaeology, Zhejiang Provincial Institute of Archaeology)
[66] *Biological Relationships of Neolithic Southeast China*

The early and middle Neolithic cultures on both sides of the Taiwan Strait share cultural similarities including ocean-centered

lifeways and trade networks, foraging patterns, deep sea and lacustrine fishing, ceramic and tool manufacturing techniques, and low intensity plant cultivation. The biological relationships between these Neolithic cultures and the earliest known likely precursor, the Hemudu culture, from the south shores of Hangzhou Bay, have not been previously examined due to a lack of skeletal material. This study uses roughly contemporaneous crania (ca. 5,000-4,000 BP) from the Tanshishan Culture of the Min River Delta and the Dabenkeng Culture of western Taiwan, earlier crania from the Hemudu culture of the Hangzhou Bay area (ca. 7,000-6,000 BP), and crania from the Pearl River Delta area dating from 6,500-3,500 BP to examine spatial and temporal relationships. Model-bound and model-free analyses of distance are used to approximate genetic distances. This study suggests a close relationship between the Tanshishan and Dabenkeng samples, and more distant relationships between these samples and the Hemudu, Taiwan Iron Age, and the modern Taiwan aboriginal sample. The Pearl River Delta samples fall furthest from the other samples.

Laurenzi, Andy (Archaeology Southwest)

[110] *Site Protection: A Glass Half Full?*

The conservation ethic of Preservation Archaeology recognizes that archaeologists are obligated to steward what remains of the archaeological record in a manner that considers opportunities for future exploration and discovery. This stewardship obligation values the archaeological record principally, if not solely, for its information content. Viewed in this manner, archaeological resources have limited religious, spiritual, aesthetic, sentimental, or commercial value. This narrow focus on information values has constrained the precontact preservation agenda. An argument is made for archaeologists to serve less in a gatekeeper role with respect to the archaeological record, and more to embrace and promote the record's importance as an inspirational element of the human family that has value equal to its scientific utility.

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

[271] *The Moravian Mission at Schaghticoke: Indigenous Survival Strategies and the Melding of Christian-Indian Ideology*

In 1743 leaders of the Native American village of Schaghticoke, situated along the Housatonic River between the English colonies of New York and Connecticut, invited Moravian missionaries to come live among them. The Moravians agreed and thus began a successful marriage between the two cultures that lasted almost 30 years, despite fierce efforts by their English neighbors to eradicate both. Unlike their British counterparts, the Moravians tolerated Schaghticoke lifeways. Mission records and other documents demonstrate mutual satisfaction in the relationship, with the Moravians saving souls in a modified "Christian" environment and the Schaghticoke leadership maintaining that environment to combat the deleterious effects of English colonialism and promote tribal solidarity.

LaViolette, Adria (University of Virginia, Dept. of Anthropology)

[61] *The Archaeology of Swahili Ritual Practice at Chwaka, Pemba Island, Tanzania*

In this paper I explore Swahili ritual practice in the town of Chwaka, an 11th-16th-century site on Pemba Island, Tanzania. The earliest Swahili of the mid-first millennium AD were Iron Age villagers who founded settlements along the Eastern African coast, and engaged with peoples from around the Indian Ocean rim through mostly trade-based relationships. An important transformation in Swahili identity was the population's conversion to Islam after exposure by at least ca. AD 750, such that Swahili was a majority Muslim society after ca. AD 1200. The Swahili world--not a unified state, but a string of urban centers with loosely organized hinterlands, and shared language, material culture, and other characteristics between them--balanced unifying traits against regional diversity and competition. The centers all boasted

a component of elegant coral/limestone architecture including mosques and tombs and usually some houses, as well as numerous earth-and-thatch structures. Chwaka provides evidence from four coral/limestone mosques, which allows examination of changing Islamic ritual practice over time including: evidence for different sects, changes in the role of women, use of ritual objects, and effects of a burgeoning population on community religious practice. I contextualize changes at Chwaka against larger-scale trends on the Swahili coast.

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

- [143] Moderator
 [143] Discussant

Lbova, Liudmila (Novosibirsk State University)

- [222] *Technological Traditions and Innovations in Primitive Art Siberia (Early Upper Paleolithic Stage)*

Recent discoveries of artifact assemblages from the Early Upper Paleolithic indicate the existence of symbolic activity, especially personal ornamentation. The question of symbolic activity is of particular interest within the wider discussion concerning the formation of culture Homo sapiens sapiens which correlates with the Upper Paleolithic context of the Eurasia. Basic archaeological research utilizes the chronological context (cultural layer, geology sequence, features, etc.), the morphological, technological image of the all artifacts, and the specific of material and processing of the technology items of personal ornamentation. In our case, we want special attention paid to technological aspects of raw material preparation, roughing blanks, its detailed design and ornamentation. In the course of studying the archaeological assemblage in Siberia dated 40,000 to 25,000-28,000 years we identified some manufacturing technologies of Primitive art pieces, including flaking, drilling, carving, grinding, and polishing.

Le Bourdonnec, François-Xavier [62] see Orange, Marie

Leach, Richard [98] see Macdonald, Danielle

LeBlanc, Kathleen (Simon Fraser University)

- [5] *Use of Tongan Barkcloth Design as an Analogue for the Lapita Design System*
 It has been argued that Oceanic barkcloth has a highly analogous design system to that found on prehistoric Lapita (3400-2600 B.P.) ceramics in Oceania. Motifs vary but there is strong evidence that structural application and several design elements are all but identical. The disappearance of Lapita wares in Tonga occurs relatively soon after initial settlement. This, however, does not lead to disappearance of the entire design system. Ngatu (barkcloth) continues to be produced by women throughout Tonga and is believed by several Oceanic archaeologists to have been a part of the Lapita material culture repertoire. Through an analysis of present-day Tongan ngatu recorded from Nuku'alofa, Tongatapu, I will set out to determine the usefulness of this design medium as an analogue for inferring various aspects of the Lapita design system, including structural application and meaning. Behavioral correlates are given strength through a direct historical analogy. If when analyzed, the structure of barkcloth design, including symmetry, orientation, and spatial boundaries, can be described in a similar sense to Lapita design, then meanings, names and organization of ngatu designs can be argued as analogous to the Lapita design system.

LeBlanc, Steven (Harvard University)

- [177] Discussant

Lebrasseur, Ophelie [20] see Larson, Greger

Leclerc, Mathieu

- [181] *The Evolving Role of the Archaeologist in an Increasingly Science-Oriented Discipline: Contributions of a Provenance Study on Lapita Ceramic from Vanuatu*

This presentation will focus on the relation between the increasingly frequent application of archaeometric analytical techniques and the underlying archaeological theory justifying the use of such instruments. Today research projects not involving "scientific" aspects are rare and it seems that they will become even more uncommon. In regard to this matter, a review of the articles published in Journal of Archaeological Science in the last few years shows the increasing amount of people using these techniques and the variability of them. It might thus be valuable to question the way archaeologists are now trained and educated. In order to use these analytical tools adequately, it could be argued that general geochemical knowledge as well as the understanding of their intrinsic scientific base are henceforth required. Archaeometric analytical techniques are a valuable asset for the archaeologist and their outcomes can be significant; a better understanding of them and the development of an archaeometric theoretical framework would surely be profitable for archaeology. Data from a provenance study (using LA-ICP-MS, XRD and zircon dating) on Lapita ceramic material from Vanuatu will be used as a case study to illustrate the point.

- [181] Chair

LeCount, Lisa (University of Alabama)

- [133] *At the Intersections of Powers: Classic Maya Markets and Commodities*

Recent studies suggest that large, Classic Maya capitals such as Tikal and Calakmul supported permanent marketplaces and smaller provincial centers, such as Xunantunich and Buenavista in the upper Belize River valley, and sustained periodic markets as well. Nonetheless, evidence of marketplaces and commodities is scarce in Belize provincial centers. Following Richard Blanton, I suggest that provincial rulers were constrained by complex local and regional intersections of power in promoting markets. The small scale and volatile nature of provincial polities limited supply and demand of goods, while other market factors, including fluctuating access to imported items, price setting, and sumptuary laws, influenced consumption. These factors resulted in non-equitable distributions of commodities across households.

LeCount, Lisa [256] see Mixter, David

Leedesma, Charmaine (University of Guam), Noel Amano (University of the Philippines) and Stephen Acabado (University of Guam)

- [7] *Hunting and Domestication: The Ifugao Complementary System*

Ethnographic and ethnohistoric sources support the view that the Ifugao (northern Philippines) subsistence system is based on intensive rice agriculture, supported by swidden fields and farm-raised animals. These sources also suggest that pigs provided the primary protein source of the Ifugao. Recent archaeological datasets, however, contradict this perspective. As a case in point, Philippine deer (*Rusa mariannus*) dominated the faunal remains at the Old Kiyyangan Village (an early Ifugao settlement dated between ca. 1000 ybp and abandoned at ca. 200 ybp) comprising ca. 70% of the recovered materials, domesticated and wild pig comes second at a surprisingly low 25% incidence. This poster presentation argues that although the pre-contact Ifugao seem to

have practiced animal domestication and intensive wet-rice cultivation, they still carried out a broad-spectrum economy, exploiting the resources available to them. This work adds to the increasing evidence that highland Southeast Asian subsistence patterns are complementary, rather than specialized systems. In addition, we suggest that the low incidence of domesticated pig in the archaeological record is indicative of the ritual significance of the domesticate, as supported by ethnographic information.

Lee, [22] see Jin, Jennie

Lee, Chulmin, Kiryong Kim (The Institute of Cultural Properties in Hanyang University), Euiju Shin, Kidong Bae (Department of Cultural Anthropology, Hanyang University) and Christopher Bae (Department of Anthropology, University of Hawaii)

[22] *Perspective of Excavation of Mosan Cave Site, Mungyeng, Korea*

This is a report of fieldwork conducted at the Mosan Cave site in Mungyeng, South Korea. The objective of the surveys and excavation at Mosan Cave was to examine the stratigraphy and associated artifacts, including ascertaining presence/absence of Pleistocene hominin fossils. The first archaeological fieldwork at Mosan Cave began with a surface survey in 2011 that included the surface collection of historic period pottery sherds and what appear to be relatively recent animal bones. A second survey at the site in 2012 included the excavation of three test pits within Mosan Cave. The excavation yielded several artifacts and more than 100 macro- and micromammal bones from two layers. The upper layer included Iron Age pottery sherds and a finely crafted stone arrowhead. Further excavations confirmed deposits more than 3 meters thick in some areas of the cave that pre-date the Iron Age. Some of these layers contained macro- and micromammal bones, including bovid/cervids and bats. Samples of associated charcoal and speleothems have been sent to the Accelerator Mass Spectrometry laboratory at Seoul National University and the Uranium Series laboratories at the University of Queensland and the University of Hawaii at Manoa for chronometric analyses.

Lee, Sang-Hee (University of California at Riverside), Seonbok Yi (Seoul National University) and Damdinsuren Tseveendorj (Mongolian Academy of Sciences)

[22] *Salkhit and Human Evolution in Northeast Asia*

In 2006, a skull cap was discovered in Salkhit, Mongolia; an important addition to understanding human evolution in northeast Asia. While no chronometric date has been published, the mixture of archaic and modern features has led to various potential taxonomic affiliations of the fossil, from *Homo erectus*, archaic *Homo sapiens*, and modern *Homo sapiens*. This research examines the pattern of archaic features observed in the Salkhit skull cap and asks if the Salkhit individual appears archaic because it is a member of an archaic population, or because it has archaic ancestors. Previous studies based on metric data have not reached a definite conclusion about the affinities of the Salkhit skull cap. In this preliminary study, Salkhit was compared to various Asian fossil hominins: Zhoukoudian (*Homo erectus*), Maba and Dali (archaic *Homo sapiens*), and Australian materials from Kow Swamp and Wilandra Lakes (modern *Homo sapiens*). Twenty non-metric features of the skull cap were examined. The null hypothesis that Salkhit is *Homo erectus* is rejected. It is concluded that the archaic features in Salkhit are due to its archaic ancestry, and not because it is *Homo erectus*.

This research was supported by NSF 0803410 and NGS W35-08.

Lee, Hui-Lin (University of Hawaii at Manoa)

[176]

Colonialism in the Beginning: Japan's Early Colonization in Taiwan

Emerging from the end of nineteenth century, Japan was the world's last rising colonial power. Historical and material records have showed Japan's colonialism was a process of learning and modifying Western colonial models. The 1868 Meiji Restoration initiated Japan's modernization; it was not until 1895 the incidental acquisition of Taiwan that transformed Japan into a colonial power. Taiwan was ceded by Qing Dynasty after the First Sino-Japanese War. Multiply colonized by Spanish, Dutch, and Chinese from the age of European overseas expansion, Taiwan was a launch point to China and Southeast Asia. Japan's colonial blueprint and techniques were burgeoning during her early colonization in Taiwan, when the local resistance and fiscal pressure had forced Japanese quickly adapted various colonial techniques. Study on plantation town Ciaotou, Taiwan, is a key to understand Japan's colonial process. Ciaotou was at first a base for anti-colonial armed resistance, where numerous townspeople were massacred by the Japanese; nevertheless, in a decade, Ciaotou turned into a model place of colonization after an sugar plantation was established. This abrupt shift mirrored the early development of Japanese colonialism, which characterizes the exercising of state power and commercial capitalism. Japan's cultural encounter in Taiwan provides a window to the world's colonial history, and a distinctive perspective from East Asia.

Lee, Gyoung-Ah (University of Oregon)

[212] *Niche Construction through Cultivation in Prehistoric Korea: Engineering Environmental and Cultural Landscapes*

Archaeology can offer a long-term perspective of human niche constructions (HNC), particularly in small-scale societies. In that regard, this presentation examines an applicability of the HNC theory to prehistoric Korea. The research aims to understand the engineered landscapes of prehistoric Korea (8,000–3,000 BP) in both ecological and cultural sense. Particularly, a series of questions in focus includes how prehistoric communities manipulated plant resources and constructed sustainable niches over the long term. Examples come from diverse landscapes, including alluvial flats, hilly uplands, and coastal plains. Firstly, environmental data of the Holocene in Korea is reexamined to check any correlation with cultural changes. The second focus is key archaeological records regarding to ecological managements. The presentation investigates a possibility of early management of economic plants and their subsequent domestication. A question of engineered Neolithic landscape is examined, based on a recent finding of dry field along the east coast. Thirdly, this research evaluates the construction of farming landscape and concurrent changes in symbolic practice as an expanding role for conscious human agency.

[289] *Discussant*

[212] *Chair*

Lee, J. Rachel (University of Michigan), Ho-Pil Yun (Gyeongnam Development Institute) and Yong-Geun Park (Dongseo Institute of Cultural Properties)

[289] *Micromorphological Investigation of an Early Mumun Period Pithouse*

Mumun Period pithouses are considered to be places where co-resident groups carried out various socioeconomic activities. However, few studies exist where the pithouses themselves are the objects of in-depth investigation. This paper provides a detailed analysis of one Early Mumun Period pithouse from the site of Chojeon-dong through soil micromorphology techniques. We use micromorphology to better understand formation processes and patterns of pithouse use and organization during a period when multiple families resided together. We also discuss the implications of the results on our current understanding of Mumun Period social organization.

Lee, Sungjoo

- [289] *The Transmission of Forming Techniques and the Specialization in Ceramic Production during the Proto-historic Period in South Korea*

In South Korea, the mixed forming procedures composed of wheel-throwing and paddle-and-anvil gestures had been widely adopted for production of the utilitarian pottery during the Proto-historic Period. Directly after the introduction of the original Chaîne Opératoire of Relang ceramic industry, the various modified forming processes had been attempted by the native potters. In the next generation, a few forming procedures were selected and transmitted to the village potters, and finally, the several utilitarian wares, such as cooking jar, serving bowl and storage pot were manufactured by only one forming method.

Leeper, Karlene

- [119] *Wake Island National Historic Landmark: Opportunities for Subsurface Archaeological Testing and Discovery*

The Wake Island National Historic Landmark derives its historic significance from the seminal World War II battles as well as its place in the development of Trans-Pacific air transportation. The historic properties inventory is well developed, with several levels of identification and evaluation of surface features, structures and buildings, as well as a recent Historic American Landscape Survey. What is not well known about the Atoll is the potential for deposits of artifacts associated with the features that could provide additional information about pre-World War II and World War II histories. Sub-surface archaeological excavations have been somewhat limited to the recovery of human remains of those killed during the war. Upcoming projects requiring subsurface disturbance are monitored to provide samples of Wake Atoll's subsurface environment in an area heavily disturbed by war, post-war and Cold War development.

LeGarde, Carrie [251] see Burch, Ashley

Legg, Robert [119] see Anderton, John

Lehner, Joseph (University of California - Los Angeles)

- [3] *Metal Technology, Organization, and the Evolution of Long-Distance Trade in Anatolia*
- This paper addresses the relationship between technology, the organization of production, and the evolution of long-distance exchange using data from Middle Bronze Age Kültepe. To date, textual lines of evidence dominate our understanding of metal industries during this time period. This evidence demonstrates how individuals and firms participated in an elaborate regional copper exchange system to generate a profit, while at the same time exporting silver and gold to Mesopotamia in exchange for exotic tin and textiles. Textual evidence also suggests that resident social groups at Kültepe cooperated in networks across regions to enhance predictable access to these valuable materials. Yet despite this important work, only recently has the scientific analysis of archaeological metal ever been conducted. This new work provides evidence for metallurgical technologies that are not well attested in the texts. Additionally, systematic analysis of metallurgical debris at the site provides evidence for a high degree of social differentiation among specialized producers involved in metallurgy. Together with the textual evidence, these data are consistent with a highly cooperative multi-tiered model of production. This paper concludes that organized production and long-distance trade are precursory characteristics to the development of expansionary states in Anatolia.

Leight, Megan

- [290] *Investigating the Late Classic Sculptural*

Program at Río Amarillo, Honduras

Río Amarillo is a rural center located northeast of Copán along the Copán River Valley that offers fascinating evidence of interactions between the urban and rural populations during the Classic period phase of human settlement. Although Copán's Principal Group and immediate surrounding environs have been extensively studied, the Copán Valley's secondary centers such as Río Amarillo have received relatively less attention in the archaeological research of the region. Previous research at the site has focused on the tenuous relationship amongst the elites residing at Río Amarillo in relation to Copán, particularly focusing on urban settlement patterns and architectural formations. My project proposes an examination of the sculptures in relation to those at the Copán polity. By investigating the relationship of these two sites, I hope to distinguish iconographic patterns that reflect this association. While Río Amarillo and Copán were roughly coeval, the impact of their similar artistic patterning has yet to be examined in enough detail. What do the later final elements of the building campaigns at Río Amarillo that so distinctly recall the Copán aesthetic, truly reflect about the individuals and rulers living at Río Amarillo and their relationship with Copán?

Lekson, Stephen (University of Colorado)

- [15] *Southwestern Cities?*

A case can be made for urbanism in the ancient U.S. Southwest, specifically in the Phoenix Basin (8th - 15th century Hohokam core), at Chaco Canyon/Aztec Ruins (11th - 14th century Pueblo regional centers), and at Casas Grandes (14th - 15th century Mogollon regional center). Those interpretations, of course, have been questioned, usually in site-specific analyses. A historic arc, however, connected the rises and falls of these sites; thus urbanism should be considered as a broadly regional and deeply temporal problem. This paper examines the nature of these three city-candidates and the trajectory of urbanism in the U.S. Southwest.

- [175] *Discussant*

Lemmen, Carsten [23] see Kaplan, Jed

Lemoine, Ximena (Smithsonian Institution) and Katelyn Bishop (UCLA)

- [68] *A Novel Method for Aging Prehistoric Pigs (*Sus scrofa*): Synthesizing Tooth Eruption and Attrition*

Reconstructing demographic profiles is valuable for revealing animal exploitation strategies at archaeological sites. For pig (*Sus scrofa*), the method presented by Grant (1982) demonstrates a promising technique for estimating age through molar wear pattern analysis. Grant's study is, however, limited: (1) it requires complete or nearly complete mandibles; (2) it uses exclusively mandibular teeth; and (3) it offers only a relative scale for aging. While some work has been done to calibrate wear stages with actual ages, a standardized methodology for using tooth wear to age pigs remains to be developed. This study presents a new synthesis addressing the limitations of Grant's work and bringing together data from both dental eruption and attrition studies to provide useful age classes. Using age data derived from the application of this method, we construct survivorship curves for two Halafian sites with domestic pig populations, and one Epipaleolithic site, where pig management is contentious. The results of these case studies demonstrate the ability of this method to reliably reconstruct age demography and distinguish age profiles between sites with different animal procurement strategies. This method provides a standardized means of collecting accurate and reliable age data crucial in examining patterns of prehistoric pig exploitation.

Lemonnier, Eva [144] see Arnauld, Charlotte

Lenci, Eric (San Jose State University; Muwekma Ohlone Tribal Member), Cara Monroe (Dept of Anthropology, University of California Santa Barbara), Alan Leventhal (San Jose State University School of Social Science) and Brian M. Kemp (Department of Anthropology Washington State University)

[38] *Ancient Human DNA Analysis from the San Francisco Bay Area; Interpreting Ohlone History through Genetics*

North-Central California indigenous culture was poorly documented after initial European contact and was eventually dismantled. However, history can be interpreted through ancient mitochondrial DNA (mtDNA) sequence data and statistical analysis. Mitochondrial DNA analysis was conducted to better understand the Ohlone tribe's population history through time and space, but also to gain more general information on California prehistory. This analysis traces maternal lineages, as well as deduces migration and intermarriage patterns. In conjunction with previously published radio-carbon and stable isotope data, mtDNA data was studied from approximately 300 burials, located in Santa Clara and San Mateo Counties, and dating from 3,000-200 YBP.

Lenci, Eric [79] see Monroe, Cara

Lenehan, Claire [181] see Popelka-Filcoff, Rachel

Lenihan, Daniel [230] see Conlin, Dave

Lennstrom, Heidi (Girl Scouts of Western Washington)

[48] *Inquiring Minds Want to Know: Bringing Archaeological Research to Very Young Audiences*

From preschoolers to senior citizens, the general public has a keen interest in archaeological discoveries. At the same time, major funders are including requirements for public dissemination of findings for academic researchers. Because these non-professionals are often (if indirectly) footing the bill, this is not an unreasonable request. Common ways to share include museum exhibits, public lectures, tours, web sites and "science cafes." These are all powerful and useful tools, but the focus of this paper will be strategies for sharing archaeological findings and methodologies with elementary school youngsters. What better way boost public appreciation and understanding of human history than to start as early as possible? Research in both formal (school) and informal (out of school) education demonstrates that children (and adults) learn and retain more information when they engage in activities that are hands-on, cooperative, and inquiry-based. In examples drawn from museum-based programs for school children and out-of-school time programs, I will touch on factors for translating archaeological research and methods in ways that can satisfy rigid national and state school standards, as well as make programming compelling enough to attract the out-of-school customers. Key elements of successful programs include simplicity, authenticity, local connections, and open-ended questioning.

Lentz, David (University of Cincinnati), Christine Hoffer (University of Cincinnati) and Angela Hood (University of Cincinnati)

[210] *The Lost World of the Zapotitan Valley: Cerén and Its Paleoecological Context*

Analysis of charcoal from the Cerén site provides insights into the regional landscape of the Late Classic period. Wood remains from tropical deciduous forests (e.g., Manilkara zapota, Cedrela odorata, Aspidosperma sp., Protium copal, Dalbergia sp. and Hymenaea courbaril) were evident. Trees reflective of the riparian forest (e.g., Haematoxylon campechianum and Ficus spp.) also

were well-represented. Curiously, pine charcoal (*Pinus* sp.), probably from the upper reaches of the volcanic cones in the region, was common at Cerén. These data indicate that the ancient Maya of Cerén were exploiting a wide range of habitats that no longer exist in the modern landscape.

Leon, Alysia (Panquilma SAA)

[108] *Two Vastly Different Burials within Close Proximity*

In this paper I would like to address the problem of human remains in regards to the varying funerary purposes found within two single household complexes within Sector 2 of the archaeological site at Panquilma. During the four-week excavation section of the 2012 summer field school, three funerary contexts were uncovered in Units 06 and 08. By analyzing and interpreting the data from those three funerary contexts, conclusions will be determined based upon the similarities and differences present in regards to the individuals based on age, sex, grave goods and the process in which the individuals were laid to rest. By doing so assumptions may be made in association to the individual's social status as well as the relationships within the household communities at the site of Panquilma located in the Lurin Valley of Peru.

León, Elisa [264] see Gomez, Esteban

Leon Estrada, Xochitl [275] see Wilson, Nathan

Leonard, Lorne [58] see Jazwa, Christopher

Lepofsky, Dana [71] see Roth, Melissa

Leppard, Thomas (Brown University), John Cherry (Brown University), Krysta Ryzewski (Wayne State University) and Emanuela Bocancea (Brown University)

[264] *New Prehistoric Sites on Montserrat, West Indies*

In this paper we present data generated by the Survey and Landscape Archaeology on Montserrat project (SLAM), a collaboration between Brown University and Wayne State University. Previous work on Montserrat's pre-Columbian settlement had confirmed the existence of both Early and Late Ceramic-period communities on the island. SLAM's new results have significantly increased our understanding of settlement in both periods, doubling the number of prehistoric sites on Montserrat. Here we review these new sites, highlighting particularly the Early Ceramic site at the Glendon Hospital and the important Late Ceramic site at Valentine Ghaut. We also present evidence for an apparently Archaic site at Upper Blake's, the first such to be identified on Montserrat. Using morphometric and technological analyses, we demonstrate the pronounced differences between the Upper Blake's assemblage and the Ceramic-phase lithic assemblages on Montserrat, but also the similarities between the Upper Blake's material and two radiometrically-dated Archaic period assemblages on neighboring Antigua (Jolly Beach and Cistern Point). Both analyses confirm that the Upper Blake's site is best interpreted as Archaic in date.

Lercari, Nicola [9] see Issavi, Justine

Lerner, Harry (Université Laval)

[98] *GIS, Microscopy, and Patterns of Use-Wear Accrual on Different Lithic Raw Materials: An Experimental Exploration of Changing Microtopographies and their Implications for Archaeological Interpretation.*

Lithic raw materials and their physical variability directly influence how use-related wear forms on their surfaces. Previous work by

the author has shown that quantifiable differences exist between different types of stone and between different samples of the same kind of stone. Digital image analysis has already been applied to a series of experimental tools with very telling results. The present paper looks at the same experimentally generated wear traces from the point of view of microtopographic variation through the use of GIS. Treating the surface of an individual tool as an archaeological landscape complements the extant digital image analysis data by considering the nature of wear accrual in a third dimension, i.e. by assessing how microtopographic variability changes during tool use as a function of raw material variability.

[98] *Chair*

Lerner, Shereen (Mesa College) and Rachel Most (University of Virginia)

[257] *Active Archaeology for Undergraduates*

When teaching introductory world archaeology classes to freshmen and sophomore-level college students, it is clear there are two types of students in our classes: those who are there because of interest-and others who are there because it fulfills a requirement or meets at the "right time." How do we capture their interest? We have focused on a thematic approach, connecting regions to themes, and asking students to connect what they learn about the past to the modern world. This integrated approach brings relevance to students in understanding the importance and value of our past. Hands-on activities, readings, and presentations requiring critical thinking are used instead of traditional test-taking.

Lerner , Harry [98] see Stemp, William

Leslie, Brian (University of Alberta), Brian Leslie (University of Alberta, Department of Anthropology), Sandra Garvie-Lok (University of Alberta, Department of Anthropology) and Robert Creaser (University of Alberta, Department of Earth and Atmospheric Studies)

[79] *Residential Mobility in the Rural Greek Past: A Strontium Isotope Investigation*

Excavations conducted at the ancient city of Stymphalos and the monastery of Zaraka in the valley of Stymphalos, Greece, yielded a number of human graves. Neither group of burials was contemporaneous with the structures in which they were interred and they are believed to represent small Christian farming populations dating to the Late Roman/Early Byzantine (4-6th c. AD) and Late Medieval periods (14-15th c. AD). A dietary reconstruction conducted by Pennycook (2008) found that most individuals had similar $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ values, while a few individuals deviated from the norm. It was suggested that these differences were the result of residential mobility.

Enamel from 20 human and 7 animal teeth was analyzed for strontium isotopes in order to investigate mobility. The faunal $87\text{Sr}/86\text{Sr}$ values, which were employed to determine the area's 'local' signature, provide evidence of long distance animal transport and are suggestive of seasonal migration. Human $87\text{Sr}/86\text{Sr}$ values indicate that there was short distance movement between the valley areas to the north, and that a few individuals likely travelled from quite farther. These results demonstrate that the observed dietary differences were likely related to mobility and that there was more movement among these people than expected.

Leslie, Brian [79] see Leslie, Brian

Lesure, Richard (UCLA)

[231] *Fashion, Collective Choice, and the Social Interpretation of Style in Mesoamerican Figurines: Two Cases from Formative Central Mexico*

Anthropomorphic figurines appear to provide a window onto the social world of Formative-period villagers of central Mexico. They promise insight into the emic social categories of the people of this era. Drawing on a recently excavated collection of Formative figurines from Tlaxcala, Mexico, I review evidence suggesting that the relation between figurine imagery and "social reality" was actually quite loose. Figurines, I argue, are less depictions of people than they are depictions of other figurines. Stylistic attributes are densely and coherently patterned, while interrelations among iconographic attributes are shallow, even haphazard. From the standpoint of social analysis, these observations are at first distressing. However, I argue it is possible to make sense of these patterns by drawing on the sociology of fashion, in particular a model of "collective choice" developed by Herbert Blumer. Viewing figurines from the perspective of collective choice yields insights into the social world of Formative villagers, even when social categories cannot be read directly off the images. To develop this argument, I compare my figurines from Central Tlaxcala to Vaillant's collections from Zácatenco and Ticoman.

Letham, Bryn and David Bilton (University of Toronto)

[170] *Settlement History and the Cultural Landscape of shishalh Territory, Northern Salish Sea*

This paper outlines the prehistoric settlement pattern in the traditional territory of the shishalh First Nation in the northern Salish Sea and explores the environmental, economic, political, historical, and spiritual factors that shaped it. While it has long been acknowledged that the impacts of colonialism were dramatically transformational for Northwest Coast peoples and recent work has been critical of ethnographic analogy in Northwest Coast archaeology's longstanding – yet flawed – search for the roots of the 'Developed Northwest Coast Pattern', our research suggests that many aspects of settlement in shishalh territory described ethnographically – the seasonal round, subsistence economy, political system, and spiritual understanding of the landscape – have a time depth of 4000 years or more. We argue that the construction and use of the cultural landscape is a historically contingent processes. Ken Ames, commenting on our previous work, said that the historical process does not necessarily preclude conceiving of culture change as an evolutionary one. We agree, and the contingent nature of history means that there are many branches in the evolution of Northwest Coast cultures. This paper describes one of those branches and seeks to situate it on the growing tree of Northwest Coast prehistory.

Leventhal, Alan [38] see Lenci, Eric

Levi, Laura J. [48] see Hard, Robert

Levi, Laura (The University of Texas at San Antonio), Antonia Figueroa (The University of Texas at San Antonio) and Sarah Wigley (The University of Texas at San Antonio)

[78] *The Temporality of Ritual*

In Tim Ingold's work, temporality references the intersecting rhythms of life that create human landscapes. For the ancient Maya, many of these rhythms were managed by ritual practitioners. This paper explores the interlocking themes of time, space, and movement distilled in Maya divinatory practices. We suggest that divination was an important household-based specialization on a par with other productive activities that required command over highly specialized knowledge and technology. We also consider the political implications of families of ritual practitioners who, although not members of a ruling elite, nevertheless were integral to the production and reproduction of community and polity.

Levin, Maureece (University of Oregon, Department of Anthropology)

[244] *Paleoethnobotanical Evidence from Food Production Sites on Pohnpei, Micronesia*

Food production plays an important role in sociopolitical systems and shapes environmental interactions. Paleoethnobotanical study is an important part of understanding past food production; macrobotanical and microbotanical remains can directly provide information on what plants were present within an archaeological site. This paper examines paleoethnobotanical evidence for prehistoric and historic food production on Temwen Island, Pohnpei, Micronesia, with the intent of understanding the relationship of food production to social and environmental processes. Specifically, it addresses what mechanisms may have contributed to the development of food production systems as described in ethnohistoric and ethnographic records. Phytoliths and macroremains provide indicators for the long-term use of certain plants in the managed agroforests and gardens; important crops include banana, breadfruit, yam, taro, coconut, and sakau (kava).

[244] *Chair*

Levine, Marc (University of Oklahoma), Leslie Cecil (Stephen F. Austin State University), Lane Fargher (CINVESTAV del IPN - Unidad Mérida) and Jamie Forde (University of Colorado at Boulder)

[140] *Mixteca-Puebla Polychromes, Marketing, and Household Ritual at Tututepec: Integrating INAA and Petrographic Techniques*

This paper discusses the results of neutron activation and petrographic analyses carried out on pottery from Late Postclassic Tututepec, a Mixtec capital located on the coast of Oaxaca, Mexico. The compositional studies included a total of 66 ceramic samples selected from two excavated commoner household contexts. The study focuses in particular on Mixteca-Puebla polychromes, among the most elaborately painted vessels from the prehispanic era. Somewhat surprisingly, these polychromes were found in relatively high proportions at commoner residences at Tututepec. The results of the two compositional studies, combined with a stylistic analysis of the polychromes provide insights regarding pottery production, distribution, and use at the capital. Our findings suggest that elites did not control polychrome production or distribution. Instead, commoners had access to polychromes from multiple producers and likely obtained these through market exchange. These elaborately painted vessels also appear to have played an important role in household ritual practices that expressed notions of commoner ideology and identity. These results demand a reappraisal of our former understanding of Mixteca-Puebla polychromes as primarily restricted to elites and distributed through elite exchange networks.

Levine, Abigail (University of California, Los Angeles)

[235] *Corporate Architecture and Complex Polity Formation in the Northern Lake Titicaca Basin: 2012 Excavations at Taraco, Peru*

Archaeological research at the site of Taraco, located in the northern Lake Titicaca Basin of Peru, has revealed much about the evolution of complex societies in the south central Andes. Taraco was a major political and economic center for north Basin populations during the late Middle (ca. 1300-500 B.C.) and early Upper (ca. 500 B.C.-A.D. 400) Formative Periods. Previous work in the high status residential sector of the site indicated that the development of the local political economy through trade and other faction-building activities led to the emergence of regional centers and the formation of complex polities in the region. The 2012 excavation season in the San Taraco sector aimed to test this hypothesis by monitoring changes in public, non-domestic ("corporate") forms of architecture over the course of the Formative. This poster presents the results of this fieldwork and assesses the degree to which Taraco's political and economic success during the Formative Period was linked to the

intensification of civic-ceremonial activities, and/or with transformations in their forms and organization.

Levithol, Sarah (Vanderbilt University)

[234] *Seeing Like the Maya: Understanding How the Sense of Sight Factored into the Construction of Central Plazas and Residential Units at the Site of Tamarindito, Guatemala through the Use of Viewshed Analysis*

The reasons behind the construction and planning of the central plazas and residential areas of the Classic Maya have been attributed to many different political, economic, social and ideological factors. This paper adds the sense of sight to the discussion by addressing how sight and its interpretation played into such building projects. By looking at the view from and the view of the two plazas and the residential units at the site of Tamarindito in the Petexbatún region of Guatemala through the use of GIS viewshed analysis, this paper seeks to understand the chronology of these structures, the reasons for their construction and the purposes they served for elite and non-elite. What becomes evident is that, as political, social, ideological and environmental factors changed throughout the region, so too did the settlement patterns at the site. This provoked the construction of two different plazas in two different areas so as to maximize the visibility of these elite structures and to reinforce elite dominance on the landscape. The non-elite, however, in the construction of their residential units, may have also used sight as a strategy to reinforce community and perhaps counter and/or emulate this elite agenda.

Levy, Thomas (University of California, San Diego)

[247] *Cyber-Archaeology: The Future of the Past*

Cyber-Archaeology is a growing field that represents the intersection between computer science, engineering, hard science and archaeology. It is the anthropological and historical questions that drive Cyber-Archaeology research. Thanks to an NSF IGERT grant, our UC San Diego team that includes graduate students and faculty has developed an integrative system for fieldwork and laboratory research. The Cyber-Archaeology system tackles the problem of 'Big Data' by integrating acquisition (research design, digital data capture tools, diagnostic imaging/Geophysics, analytical diagnostics), curation (data storage, geo-spatial mapping, augmentation), analyses (modeling & simulation, visual analytics, crowd sourcing, 3D visualizations) and dissemination (print publishing, cyberinfrastructure, citizen science). This paper presents an overview of our Cyber-Archaeology system deployed in the ancient mining and metallurgy district of Faynan in southern Jordan.

[105] *Discussant*

Levy, Thomas [201] see Knabb, Kyle

Lewarch, Dennis (Suquamish Tribe)

[206] *Ceramic Distribution Patterns among Aztec Period Houses, Coatlan del Rio Valley, Morelos, Mexico*

Data from 3,500 4-x-4-m surface collection units distributed across eight Aztec period sites in the Coatlan del Rio Valley of western Morelos, Mexico, are used to define 360 residential midden from single houses and multiple household patio groups. Artifact counts from 50 excavated Aztec houses at Capilco and Cuexcamote, Morelos provide a model of expected artifact densities and spatial distribution patterns in surface assemblages. An analysis protocol to partition surface artifact distributions into meaningful analytic units is summarized, taking into account effects of formation processes, sampling design, statistical interpolation algorithms, and class interval selection techniques. Household assemblages are compared using cluster analysis and multidimensional scaling techniques to identify groups of functional ceramic classes

analogous to economic functional units employed by economic geographers. Distribution of decorated pottery, including local Tlahuica types and imported Aztec pottery from the Basin of Mexico, shows ceramic artifact flow throughout valley households. Valley-wide distributions of functional groups, decorated ceramic classes, and indicators of craft activities, such as spindle whorls and spinning bowls, provide insights into Aztec period economic organization in the Coatalán del Río Valley.

Lewis, Chelsea B. [33] see Wales, Susannah

Lewis, Cecil (University of Oklahoma) and Raul Tito (University of Oklahoma)

[79] *Ancient Metagenomics*

This paper discusses the potential use of metagenomics as a complimentary method to explore information about an individual's diet, health status and other aspects of their lifestyle. A metagenome refers to the total genetic material recovered from an environmental sample. The environment can include rivers, soils, or even human body sites. As a consequence of next-generation DNA sequencing technologies, we are experiencing a golden age of metagenomics, where new tools are allowing the molecular characterization of environments in ways that were previously inaccessible. We include an overview of microbiomes, referring to the genetic elements of microbes from metagenomic samples. Human microbiome research was a recent roadmap initiative for U.S. National Institutes of Health and the European MetaHIT. Metagenomic research is beginning to impact archaeology. Recently, it was discovered that human microbiome information can be retrieved from archaeological materials such as coprolites and dental calculus. As a result, human microbiome health associations and human lifeway information originally discovered from clinical studies can be applied to prehistoric studies, opening new lines of evidence for reconstructing the past. In our presentation, we discuss the emerging field of ancient metagenomics, with examples focused on novel information attainable from, and for, the archaeological record.

Lewis, Jennifer (Simon Fraser University)

[262]

Transcolonial Perspectives on the Misappropriation and Restoration of Archaeological Heritage at Fort Apache and Theodore Roosevelt School National Historic Landmark, White Mountain Apache lands, AZ

This paper focuses on Fort Apache-Theodore Roosevelt School (FA-TRS), AZ, and stakeholders' access to and use of archaeological heritage at the site. Begun as an archaeological inventory of the site, this project has grown into a comparison of customary and US heritage management policy and practice, as well as issues of intellectual property (IP). During conversations with Indigenous and non-Indigenous peoples associated with FA-TRS (school students, staff, and historic park personnel), it became clear that this site is not strictly Indigenous or non-Indigenous; more than "entanglement" exists at FA-TRS. Specifically, if the site of FA-TRS is associated with memory and cultural identity for people from diverse backgrounds (including European settlers, Chinese Americans, Latin Americans, African Americans, Western Apaches, Hopi, Zuni, Navajo, US military, tribal, and educational officials), who "owns" these memories? Can cultural identity associated with a particular site be claimed by any one cultural group? Does accepting multiple groups' and individuals' claim on FA-TRS as representative of "their" past diminish others' similar claims? This examination presents the opportunity to examine larger IP issues emerging at previously-colonial sites, as Indigenous groups assert their active role in colonial processes, and non-Indigenous group claim these sites as representative of their own history.

Li, Min (UCLA)

[56]

Political Experimentation, State Formation, and the Emergence of Central Plains

In his recent contribution to state formation theory, Henry Wright characterizes the dynamics of early statecraft as a process of political experimentation, which included failed attempts, diverse choices, and multiple trajectories. Experimentation involves the building of knowledge based on understandings of the past, real or invented. This paper examines the nature and process of political experimentation in the central highlands of prehistoric China before the emergence of the Erlitou state in the early second millennium BC. It explores the repertoire and reconfiguration of knowledge involved in the representation of political authority during the late third millennium BC. The syncretic development marks a critical shift in ideologies of political landscape, which gave the notion of the Central Plains its spatial definition and symbolic potency.

Li, Feng (Columbia University)

[66]

Reconstructing a Frontier Culture: Ceramic Analysis in the Guicheng Project

On previous occasions of the SAA, I discussed some other aspects of the Guicheng project. In the present paper, I plan to discuss the result of our preliminary analysis of ceramic materials from Guicheng. These include pottery wares unearthed during the 2009 test-excavation, pieces collected during the surface survey in 2007-2010, and sample pieces currently housed in the Longkou Museum (47 shards in two packets were subject to petrographic analysis in 2007 and 2011). The Guicheng pottery typifies a situation in which the process of local development was suddenly interrupted by the invasion of a new culture accompanying the rise of large urban centers in eastern Shandong peninsula. Politically, this change can be related to the expansion of the Western Zhou state in the 10th century BC into the eastern peninsula from the Yellow River basin. Therefore, wide range of typological variation and high degree of cultural mixture characterized the early pottery assemblages from Guicheng. However, as time passed, the newcomer pottery tradition gradually took on elements from the indigenous manufacturing tradition and developed new features of its own, thus transforming itself into a new local culture that dominated the eastern Shandong peninsula during the 7th-5th centuries BC.

Li, Kuangti [66] see Jiao, Tianlong

Li, Zhipeng, Roderick Campbell (Institute for the Study of the Ancient World, New York), Yuling He (Institute of Archaeology, Chinese Academy of Social Sciences) and Guoliang Cheng (Institute of Archaeology, Chinese Academy of Social Sciences)

[66]

Transformations of Industry during the Early Bronze Age in Ancient China: Bone Working at Erlitou and Anyang

In the first half of the second millennium BCE, bone workshops at Erlitou were located within and near the palace-temple district and perhaps mainly provisioned the royal court and elites. By the end of the 2nd millennium BCE, however, at Anyang, bone working occurred on in large workshops on a scale that suggests a much larger body of consumers. This paper will explore the development of bone working and its possible social-economic significance at the two Central Plains megacenters at either end of the 2nd millennium.

Li, Shuicheng

[179]

A Symbol of Immortality: The Tradition of Burial with Jade in Ancient China

Jade is one of the marks of Chinese ancient culture. With its crystal texture, wonderful colors, and natural beauty, jade has long been regarded as the symbols of magical powers to the Chinese. Jade has not only been worshiped, admired and daily used, but has also played a special role in funerals for a long time. Its

influence has continued even to today.

5,000 years ago, the high society of Yangtze River downstream and West Liao River used a large number of jades in their burials, which formed a unique burial culture, associated with the belief that jade could provide the immortality of the deceased's body and soul. In result, jade has been given some kind of beyond-material mystery, became the symbol of personal identity, power and hierarchy, and contained ancient religious and moral connotations. New archaeological discoveries show that the behavior and conception of burial with jade in China can be traced back to a far more ancient period.

Li, Dongdong (University of Pittsburgh), Tao Li (Department of Anthropology, University of Pittsburgh), Francisco Garrido (Department of Anthropology, University of Pittsburgh) and Wugan Luo (Graduate University of Chinese Academy of Sciences)

[202] *Comparative Study of Alloying Technology in Bronze Age North Chile and Central China*

This research investigates alloying technologies that were employed by two different Bronze Age cultures: one is from Hubei, a province with rich forest and copper resources and abundant precipitation in south-central China (East Asia); the other is from the Atacama province, where is now the world's driest desert and has the world's largest copper mine in Northern Chile (South America). The comparative study is chosen mainly for two reasons: (1) Both of the two regions are rich in mineral resources (mostly copper, but also silver and gold) and are assumed to be explored as a dominant copper mining area for bronze production in the Bronze Age. (2) Bronze artifacts that have been found within each of the two regions are generally considered to be locally produced using local mines. Chemical compositions of 400 Inca bronze artifacts and 120 Chinese Shang and Zhou bronze artifacts are compared using data from our 2012 summer fieldwork in Chile and those published by Chinese scholars, trying to understand how metallurgy was developed differently in two very different environments. Expected results also include a deeper understanding of mining and smelting technology, power and control of resources, specialized production and social complexity in both regions.

Li, Tao (University of Pittsburgh), Tao Li (Department of Anthropology, University of Pittsburgh), Francisco Garrido (Department of Anthropology, University of Pittsburgh), Dongdong Li (Department of Anthropology, University of Pittsburgh) and Wugan Luo (Department of Archaeometry, Graduate University of the Chinese Academy of Sciences)

[202] *Scientific Investigation of the Inca Archaeological Materials from Chile's Atacama Desert: An Experience with Portable Xrf Analyzer for In-Situ Chemical Analysis*

By using a portable X-ray Florescence (pXRF) analyzer, we performed in-situ chemical analysis on more than 466 metal artifacts from Atacama region housed in different museums in Chile. Besides soils, slags and distinctive minerals at the Inca mining or residential sites, pigments used in pre-Inca and Inca potteries and rock paintings were also investigated. Preliminary observations are: (1) Copper-based artifacts from the Copiapo Valley are generally high in arsenic (As), although some also show high levels of tin (Sn). In Caldera (coast of Copiapo), copper-arsenic bronzes were fewer and copper-tin or copper-zinc artifacts seemed to be more popular. Leaded artifacts are barely used in both regions. (2) Subtle variations in chemical compositions were also observed within copper-based artifacts from the same region. (3) Besides pure silver or gold, metals were also alloyed differently to produce silver or gold artifacts. Intentional addition or alloying is therefore strongly indicated. (4) "I"-shaped artifacts without any use wear turned out to be almost pure copper, which supports a general assumption about their function as ingots. (5) Iron arsenic minerals, arsenopyrite (FeAsS), were chemically proven to be used as red pigments in both Inca pottery and rock paintings.

[202] *Chair*

Liberotti, Giovanna (Universidad Nacional Autónoma de México) and Annick Daneels (Universidad Nacional Autónoma de México)

[264] *Inferring Archaeological Meaning through Graphic Data: From the Excavation to the 3D Reconstruction of a Building Sequence at La Joya (Veracruz-Mexico)*

This work aims to underline the value of a proper graphic record throughout the stratigraphic excavation, using a methodological approach which combines technical innovations with the archaeological interpretation of data. In 2004 the Anthropological Research Institute of UNAM-Mexico initiated extensive excavations under the direction of Dr. Annick Daneels in La Joya, a prehispanic archeological site located in central Veracruz, near the confluence of the Jamapa and Cotaxtla Rivers, on the Gulf Coast. This city was an important political center with monumental earthen architecture, whose remains have been dated to the epi-Olmech and classical period (200 B.C. – A.D. 1000). After a careful study of the topography and the formation processes of the main mounds, the graphic documentation realized during previous campaigns has been elaborated with computer programs. These preliminary steps provided new information on the building process of monumental structures in the East Platform. Finally, the 3D reconstruction helped to understand the complex construction sequence observed in East Platform, as a palatial residence was transformed after several renovations into a memorial pyramid to a main character.

Lieske, Rosemary (Brigham Young University)

[126] *Izapa Group B: Revisiting the NWAF Excavations of the 1960s*

Despite the archaeological and cultural significance of Izapa to the Soconusco region of southern Mexico, limited publications are available concerning the major excavations conducted there in the 1960s by the New World Archaeological Foundation. Using both published and unpublished materials, this paper will present a new comprehensive history of those excavations, specifically in regards to Group B. Particular focus is placed on the context and location of monuments, burials, and offerings. Additionally, this paper will identify and separate possible burials among the offerings discovered during those four field seasons at Izapa, while addressing issues of chronology and sequence.

Lieverse, Angela (University of Saskatchewan)

[219] *Lower Limb Activity in the Cis-Baikal: Enthesal Changes among Middle Holocene Siberian Foragers*

Lower limb enthesal changes are evaluated in order to reconstruct activity levels and more fully understand cultural and behavioral transition among the middle Holocene (ca. 9000-3000 years BP) foragers of Siberia's Cis-Baikal region. The four cemetery populations examined span a period of dramatic diachronic change characterized by an 800-1000 year hiatus in the region's cultural continuity. Findings suggest a dynamic pattern of cultural variability in the Cis-Baikal, with geography (i.e., site location within particular micro-regions) appearing to be just as important a factor as cultural/temporal affiliation in explaining inter-site differences in enthesal morphology.

[194] *Chair*

Lightfoot, Kent (University of California, Berkeley), Lee Panich (Santa Clara University), Tsim Schneider (University of California, Berkeley) and Sara Gonzalez (Carleton College)

[283] *Anthropogenic Transformations and European Colonialism: The Effects of Early Historical Globalization in Western North America*

The purpose of this paper is to examine significant anthropogenic transformations that took place to the global environment with the advent of European colonialism beginning in the late 1400s. The paper will consider the effects that fur trade outposts, mission

communities, settler colonies, and plantations had on local environments and biotic communities. While the processes unleashed with colonialism involved the invasion of non-native species, the disruption of native habitats, and the loss of biodiversity on a global scale, how these processes played out locally varied greatly in space and time. This paper will consider how the processes and consequences of globalization were manifested in western North America with the development of the fur trade and the establishment of missions and ranchos. In outlining the specific impacts that early forms of globalization had on local environments in Alta and Baja California, we stress that these transformations had major consequences for indigenous anthropogenic practices that had been shaping the region's ecosystems for many thousands of years.

Ligman, Michael (Logan Simpson Design, Inc.)

- [124] "Put that in your pipe and smoke it:" An Exploratory pXRF Study of Native American Ceramic Tobacco Pipes at Jamestown, VA
Within the field of Chesapeake archaeology, studies concerning Native American ceramic tobacco pipes often focus on the use of technological, morphological, or decorative aspects to create broad, regional typologies and ignore diverse ideological/cultural meanings associated with pipes, such as intergroup social/political relations or ceremonial/ritual practices. While attribute-based typologies allow for broad, regional cultural affiliations to be identified, the use of chemical composition analyses has the potential to help archaeologists determine the cultural sources of these pipes based upon the source clay material. This allows for more nuanced discussions of larger cultural questions related to these pipes, such as interaction patterns between early colonial and Native American groups in the Chesapeake. This study uses portable X-ray Fluorescence spectrometry (p-XRF) in an attempt to determine the cultural and/or material source of Native American pipes recovered from early 17th century contexts at the Jamestown site in Virginia. Compositional data was recorded for both the unknown pipe samples from Jamestown and a comparative collection of Native American pipes from 11 Late Woodland sites in the surrounding Chesapeake region. Using the results of this study, the interpretive potential for pXRF in this and future compositional analysis studies in the Chesapeake will be discussed.

Lilley, Ian (The University of Queensland)

- [146] Subsistence, Middlemen Traders, and Precolonial Globalization in Melanesia
The kula and other long-distance exchange networks of coastal northwestern Melanesia have attracted scholarly attention for over a century. This is because, despite their scale and complexity, these systems were based on "unbusinesslike" ceremonial exchange motivated by political competition rather than economic factors and integrated the worlds of far-flung groups of acephalous, kin-based and technologically Neolithic societies, in most cases through a few communities of specialist middlemen traders completely dependent on exchange for survival. Historically, these features challenged prevailing social-evolutionary theory concerning the capacities of societies lacking chiefly or state-level organization. This meant that, notwithstanding their local and regional importance, these networks, like similar 'Oceanic oddities' such as the so-called 'empires' of Tonga and Yap, were seen to exist "outside the realm of world historical experience." This paper discusses the archaeology of one such system centered on the Siassi Islands between New Guinea and New Britain and described in Tom Harding's classic ethnography, *Voyagers of the Vitiaz Strait*. The focus is on evidence for 'glocalization.'

[192] *Discussant*

[292] *Chair*

Lim, Sangtaek (Pusan National University)

- [289] Exchange Systems and Socioeconomic Changes: Case of Southern Korea and Japanese Kyushu during the Neolithic Period
This presentation investigates changes of exchange system in connection with socioeconomic aspects between groups of Southern Korea and Japanese Kyushu during the Neolithic period. Exchanges between the two regions identified by the exchange items like potteries, stone tools and ornaments lasted through the whole period, but intensity of exchanges is fluctuated, being stronger during Initial to Early phase and Final phase than other ones. These fluctuations are closely related with socioeconomic needs of each regional group, so this presentation focuses on the process of socioeconomic changes in each region and its relation with exchange systems. Exchange systems between the regions experienced two times of major changes on their nature, intensity, and contact area through the entire period: Early to Middle and Late to Final phase of southern Korean Neolithic period successively. These changes linked with socioeconomic shift such as the spread of incipient agriculture, movement of contact area from Tchushima(對馬島) to southern part of Korea, instability of subsistence system and influx of new cultural traits into the regions etc.

Lin, Sam (University of Pennsylvania), Matthew Douglass (University of Nebraska-Lincoln), Daniel Parker (University of Auckland) and Simon Holdaway (University of Auckland)

- [5] Stone Artifact Selection and Transport in the Semi-Arid Zone of Western New South Wales, Australia

Understanding stone artifact selection and transport is at the heart of hunter-gatherer archaeology. Much of this work relies on the analysis of visible traces of modification and movement, such as raw material sourcing, refitting, and the extent of retouch/resharpening. However, the absence of these traces does not necessarily indicate the lack of artifact transport and curation. Through computer simulation (bootstrapping) with experimental assemblages, we demonstrate the interaction of artifact production, selection and removal on cortex quantification and assemblage proportion. Comparing to archaeological data, these results corroborate previous observations that the Holocene surface lithic assemblages in semi-arid western NSW, Australia are characterized by post-production artifact selection that consistently biases the cortex-to-volume ratio of the assemblage, thus indicating preferential export of unretouched large flakes and high mobility.

LIN, Yu-Hai [66] see Jin, Guiyun

Lin, Kuei-chen (UCLA)

- [249] Pottery Production in the Ancient Chengdu Plain

In this study, I examine the chaîne opératoire of several major pottery vessels circulated during the Bronze Age in Sichuan, China by focusing on several dimensions of the craft production, especially the degree of standardization, the changing social values of the products when used in different contexts, and the constitution of work groups (household or workshop...). Using metrical measures and both the mineralogical and chemical analyses, including XRF, XRD, and petrographic study, I show that pottery produced within a delimited spatial and temporal span shares certain commonalities in manufacturing techniques across distinct vessel types and workshops. In addition, I suggest that an analysis of manufacturing technologies, combined with an understanding of production-related loci, burial data, and other social and cultural contexts, allow us to classify craft products through approximating potters' cultural and technological choices. This classification provides us with another avenue towards typology. I close my discussion by considering the organization of production and social control over the craft system.

Lindeman, Michael [175] see Wallace, Henry

Lindeman, Michael (Desert Archaeology)

- [175] *Households, Plazuelas, and Plazas: Decision Making and Social Standing among the Pre-Classic Hohokam*

The pre-Classic Hohokam are a unique case of large-scale irrigation agriculturalists with muted visible examples of social differentiation. Investigations of pre-Classic Hohokam households have repeatedly shown few material differences between households suggesting disparity between households was limited. I suggest that decision making was dispersed among households and groups of households within villages and communities. Such diffuse decision making would serve to dampen social differentiation and material differences between households. Hohokam villages typically display several levels of organization building on groups of households. Small groups of households arranged around plazuelas or larger groupings of households set around plazas are repeated at multiple villages in Hohokam communities, providing clues to ways in which decision making was organized and social power distributed among the Hohokam.

Lindsay, Ian (Purdue University)

- [225] *Political Arrangements among Farmers, Mobile Pastoralists, and Fortresses in the LBA Armenian Highlands*

Historical accounts of ancient polities within the broader Near Eastern ecumene typically consign mobile pastoralists to marginal roles as sources of finished pastoral goods and raw materials (at best) or as marauding invaders (at worst); in short, backward nomads were viewed as threats, not contributors, to urban life and political evolution. However, recent discoveries among hilltop fortresses in the South Caucasus suggest that pastoralists, not full-time farmers, constituted the region's earliest complex polities during the Middle and Late Bronze Age periods (c. 2200-1150 BC). This paper discusses recent archaeological findings at a LBA fortified settlement in Armenia's Tsaghkahovit Plain, where geophysical survey and excavations have revealed stone walls of a domestic complex enclosing LBA living floors, storage pits, groundstone, and faunal and botanical remains commonly associated with settled agro-pastoralism. Mounting architectural and stratigraphic evidence, however, suggests that the occupants maintained deeply-rooted traditions of seasonal mobility from the earlier MBA. Such data further expose the fluid boundaries between mobile pastoralists and farmers in antiquity, as well as the challenges LBA fortress-based polities faced in sustaining allegiance among mobile subjects. These complex settlement and subsistence arrangements are contextualized through the settlement's economic and ritual ties to a shrine complex across the plain.

Lindsey, Benjamin Keola (Office of Hawaiian Affairs)

- [53] *Discussant*

Linford, Samantha (University of California Santa Cruz) and Michael Whalen (University of Tulsa Oklahoma)

- [267] *A Design Analysis Comparing Escondida Polychromes and Gila Polychromes*

Escondida has been cited as a copy of Gila Salado Polychromes, but there has been no formal study on the actual design components and execution of Escondida Polychromes compared to Gila Polychromes. Using photographs of Escondida and Gila sherds from Site 204 and Paquime both located in Chihuahua, Mexico, I will provide a preliminary comparison of design focusing on motifs and style of execution in order to better understand the relationship between Escondida and Gila Polychromes.

Lingle, Ashley

- [9] *Deconstructing the Walls of Çatalhöyük*

The painted plaster walls of Çatalhöyük have been a source of fascination since their discovery in the 1960's. The paintings have provided insight into the lives, interests, and chronology of the people at the site. Painted walls at the site include: painted niches, handprints, complex geometric patterns, and representations of humans and animals. This poster is a visual representation of a two-season study of one geometric painting in particular, and how examining the painting in conjunction with the stratigraphy of the plaster layers beneath has yielded some interesting results. For the first time at Çatalhöyük there is clear evidence of multiple repairs to a painting, or "Neolithic Restoration." The poster will highlight the process by which the interpretation of the painting evolved from initial discovery to its current state. The documentation and preservation of the painting has been a collaborative effort in visualization and conservation; this has resulted in a blend of traditional and new recording methodologies in order to most effectively preserve information while keeping future accessibility in mind. The uncovering of this painting provides specialists with further research questions of assemblage relating to the maintenance and resources invested into paintings at the site.

Lints, Andrew [258] see Boyd, Matthew

Lipe, William (Washington State University)

- [110] *Discussant*

Lipo, Carl [167] see Hunt, Terry

Lippert, Dorothy (National Museum of Natural History)

- [169] *Is Repatriation a Decolonized Process?*

Museums and institutions have engaged with descendant communities through the process of repatriation. Bodies formulated through archaeological knowledge production are different than bodies formulated through Indigenous community knowledge and repatriation has restructured the identification process. Many other types of objects within a museum are similarly restructured. The relationships that have resulted have led to expanded means of collaboration, among these, the practice labeled "digital repatriation." Objects that are not subject to physical repatriation may be digitally repatriated. This paper will critically examine this type of collaboration and evaluate whether it, or any form of repatriation is truly decolonized.

Lippi, Ronald (University of Wisconsin) and Alejandra Gudiño (University of Missouri)

- [165] *Collaborative Archaeology in Northwestern Ecuador: Yumbos, Tsachilas, Mestizos and Other Stakeholders*

The Palmitopamba Archaeology Project in Ecuador has slowly shifted from a scientific endeavor to a collaborative, social one as a means to pay back the impoverished community that has welcomed and supported our crew for several years. As is true for most archaeologists, we are not trained for this. Together with various interested parties, we have ambitious plans, but special challenges mean slow progress, as we will report. A stakeholder analysis and a reconsideration of our goals and capabilities give us a better link to reality and should be of value to others contemplating similar collaborative projects in archaeology.

Lippiello, Lauren

- [51] *Spatial Distribution of Upper Egyptian Rock Art as Indicator of Marginal Landscapes, Fourth Millennium B.C.E.*

As early as the mid-5th millennium B.C.E. the repertoire of Upper Egyptian and Nubian rock art images and the principles that govern their creation have a direct relationship with the development of politico-religious ideology of the prehistoric Egyptian culture. The study of this form of communication further expands the current understanding of the political, social, and religious relationships amongst administrative elites and other elements of the broader society. More specifically, the geographic distribution of symbols on an intra-regional level and the degree of stylistic variability between similar images on an inter-regional level confirms existing archaeological evidence suggesting the presence of a Nagada core culture near the Qena Bend and expands the current understanding of the politico-religious relationship between the population centers and the hinterland (marginal areas). The present study utilizes both published and unpublished rock art images that correspond to the following motifs: Watercraft (specifically, knife blade boats), boat cabins mimicking terrestrial shrines, and the decorative motifs that distinguish the Sokar boat.

Little, Keith [284] see Cyr, Howard

Littleton, Judith (University of Auckland), Melinda Allen (University of Auckland), Gina MacFarlane (University of Auckland) and Hannah Cowie (University of Auckland)

[219] *Humans and Other Animals: Environmental Change in the Marquesas*

Environmental change affects not just humans but also their animals. In this paper we apply techniques of paleopathology: the analysis of linear enamel hypoplasia (LEH), caries and calculus to pig, dog and human teeth from the Marquesan Island of Nuka Hiva. Our hypothesis is that environmental changes known to occur throughout the last millennium will be reflected in these markers of non-specific stress and diet but that the response of different species varies by virtue of their specific life history and ecological position.

LEH was identified in all three species and at surprisingly high rates among the pigs (38% of teeth, n=123). There was for this species a significant increase in the prevalence of LEH over time from 25.0% for the early period to more than 60% for the early historic period. At the same time, however, caries and calculus also increased dramatically. The human sample was too small to observe change over time but for the dogs it appears that the timing of LEH reflects a distinctly different series of stressors and LEH formation. In this instance inter-species variation can reflect the adaptations that people make in response to environmental variation.

Littleton, Judith [219] see Scott, Rachel

Littman, Robert (University of Hawaii), Mohamed Kenawi (Alexandria Center for Hellenistic Studies, Bibliot), Jay Silverstein (JPAC/University of Hawaii) and Nicholas Hudson (University of North Carolina, Wilmington)

[176] *Who Is This Like the Nile That Riseth Up: Ethnic Relations at Thmuis, Egypt*

When Alexander the Great arrived in Egypt liberating an anxious population from Persian rule, a wave of Hellene immigrants followed. The succeeding Ptolemaic dynasty strove to establish legitimacy through what might be called the Hellenization of the Egyptians, or Egyptization of the Greeks, generating new hybrid icons and deities in a fusion that reverberated throughout the Hellenistic world. Yet the institutions that evolved did not assuage the angst of social, political, and economic subjugation; as Ptolemy V took the throne, rebellion consumed Egypt. In the aftermath of insurrection, Greek Thmuis grew to primate status in the Mendesian nome. When Augustus claimed Egypt for Rome, the hybrid Greco-Egyptian culture assumed a new Romanized stratum.

We present recent data from the University of Hawaii Tell Timai

project, providing a unique glimpse into the dynamics of Egypt in Late Antiquity. Excavations in the north Timai have revealed the violence of Hellenistic rebellion while excavations in the center of the kom carry the fingerprint of the Roman world system. In this rare example of a near complete Greco-Roman Egyptian city, we are finding insights into the dynamic processes of colonization and imperialism in a realm that was a crucible for Western ideology.

Liu, Guoxiang [66] see Liu, Li

Liu, Li (Stanford University), Xingcan Chen (Institute of Archaeology, Chinese Academy of Social Science) and Guoxiang Liu (Institute of Archaeology, Chinese Academy of Social Science)

[66] *Functional Analysis of Grinding Stone Tools from Early Neolithic Settlements in Northeast China*

Xinglongwa (ca. 6200-5200 B.C.) and its predecessor Xiaohexi are the earliest Neolithic cultures in Northeast China in which sedentism emerged. The Xinglongwa culture has also revealed the earliest domesticated millets in this region. In order to gain a more holistic view of the economic activities of these early communities, we carried out usewear and starch analyses on grinding stone tools from three sites of these two cultures. The preliminary results suggest that in addition to food production, collecting non-cereal foods, particularly tubers, played a significant role in the early stage of Neolithization in Northeast China.

Liu, Miao (Xiamen University) and Chunming Wu (Xiamen University, China)

[95] *Early Maritime Cultural Interaction between East and West: A Preliminary Study of the Shipwrecks of 16-17th Centuries Investigated in Southeast Asia*

About 10 shipwrecks investigated in southeast China and Southeast Asia fall into the 16-17th centuries, including cargo remains characterized by Swatow ware or Clark Ceramics. These shipwrecks cover early history of maritime contact and interaction between East and West initiated by both the earliest colonists from the West, such as Spanish and Portuguese, and illegal maritime merchants who smuggled against sea prohibitions of the Ming Dynasty. According to local writing of a sailing guide of that period discovered in southeast China, this early maritime cultural contact between East and West happened in the triangle formed by Japan, southeast China and Southeast Asia. These shipwrecks and related cultural heritage show a series of artifacts as ceramics of Zhangzhou Kilns and local agricultural products exported from the Ming empire on one hand, and exotic artifacts as cannons and coins from Spain and Portugal imported to the Ming empire, on the other hand. This interaction started the earliest globalization in Asia and the Pacific.

Liu, Chin-hsin (Appalachian State University) and John Krigbaum (University of Florida)

[219] *Population Dietary Diversity and Individual Life History of Late Metal Age Central Thailand*

Central Thailand is a vast area with highly diversified geology, waterways, climate patterns, and biota. Toward the later part of Metal Age, it underwent a gradual process of social complexity increase, as evident by changes of ceramic tradition, mortuary practice, and landscape alteration. Human dietary behavior is a direct indicator of human-environment interaction during this period of cultural change. Stable isotopic ratios from human tooth enamel apatite are used to infer human dietary choices across the landscape and through time. Three central Thai sites are selected for analysis, Ban Mai Chaimongkol, Promtin Tai, and Ban Pong Manao. They are located on terrains with differing characteristics but are somewhat overlapping in chronology, ideal for a regional and temporal assessment of human foodways. When possible, individual life history inferred from isotopic discrepancies between

bone and enamel tissues is addressed. Results indicate that people's diet during this period was highly locale-specific. Locally available food resources largely determined people's dietary choices. This is supported by the biological remains recovered from the sites. Evidence of individual dietary change between earlier and later lifetime is also observed, suggesting change of residency and/or foodways. Causes and scale of people's movement across the landscape warrant further investigation.

Livingood, Patrick [34] see Lockhart, Jami

Lizano, Pablo [78] see Pugh, Timothy

Ljungkvist, John (Uppsala University)

[55] *Gamla Uppsala: The Funerary Landscape of a Mythical Center in Sweden*
No place in Old Norse Scandinavia is so frequently mentioned in saga texts as Gamla Uppsala, situated in central Sweden. Many medieval texts, originating from earlier oral traditions, describe a royal domain inhabited by ancient kings. In the 11th century, Gamla Uppsala was not only a major royal and religious center of central Sweden, it was also a mythical place whose ancient heritage was deeply manifested in an unparalleled funerary landscape. Recent research has also enhanced the picture of a site that saw the dramatic construction of various monuments. Around 600 CE, persons with royal aspirations systematically raised a combination of monuments on a scale unrivaled elsewhere in central Sweden. A series of huge mounds, extremely richly decorated hall buildings elevated on artificial plateaus, road systems and boundary markings stretching over kilometers in length present us with an extraordinary monumental entity. Deeper studies and new excavations reveal not only that aristocratic burial rites were official public displays, but also that even the great hall and adjacent manor buildings were at the core of burial rites that included cremation, ritual deposition and closure.

Llamas, Bastien (Australian Centre for Ancient DNA - University of Adelaide) and Wolfgang Haak (Australian Centre for Ancient DNA - University of Adelaide)

[272] *In-depth Analysis of Immune Genetic Diversity in Precolumbian Central Andean Populations*
Historic accounts estimate that the South American indigenous population size declined by up to 95% between the period of initial contact with Europeans and the beginning of recovery. Most archaeologists and epidemiologists agree that Old World diseases played a major role in this abrupt population collapse. We used advanced ancient DNA techniques to characterize the genetic diversity of loci involved in immune response in pre-Contact Central Andean populations. We have created immortalized ancient DNA libraries using human remains from various periods ranging from the Archaic Period to the Late Horizon. Results from shotgun sequencing showed that nuclear information and complete mitochondrial genomes could be retrieved from well-preserved samples. We have then generated a large and unique genetic dataset using a customized targeted enrichment protocol and Next Generation Sequencing to genotype thousands of immunogenetic markers.

By contrasting this major genetic survey of pre-Columbian immunogenetic diversity with modern-day populations, which harbour a low (immuno-) genetic diversity, we can test whether indigenous populations were immunologically 'naïve' to Old World diseases, and as a consequence suffered very high levels of mortality.

Lobiondo, Matthew (University of Vermont), Cameron Wesson (Lehigh University), John Cottier (Auburn University), Hamilton Bryant (Auburn University-Montgomery) and Holly Luscumb (University of Vermont)

[6] *Remote Sensing at the Ebert-Canebrake Site (1Mc25), a Central Alabama Fortified*

Mississippian Village

Traditional archaeological investigations in the 1990s revealed the presence of a complex fortification system along one side of the Ebert-Canebrake Site (1Mc25), a multi-component Mississippian village on the Tallapoosa River in Central Alabama. Over the past decade, several additional archaeological investigations focused on identifying other vestiges of this fortification system, with these projects resulting in a general understanding of the spatial patterning of this feature. However, the precise size, shape, and function of this fortification remained unknown until the summer of 2012, when a remote sensing survey and ground truthing program were undertaken. Results of these additional investigations revealed key details on the nature of this fortification and its possible role as a defensive perimeter for the residents of Ebert-Canebrake.

Lockard, Gregory [90] see Gabler, Brandon

Lockard Reed, Angela (Grand Valley State University/University of Pittsburgh)

[176] *Colonial Witch Bottles: A Spirited Public Archaeology Activity*

Professional archaeologists have a commitment to public outreach. Through hands-on activities, students, both young and old, become not only actively interested in the "past" in the abstract, but also in the study and preservation of history. For an alumni event at Grand Valley State University over Halloween weekend in 2011 I created a colonial folk magic activity at which participants could learn about the archaeology of magic and create witch bottle replicas to take home. People on both sides of the Atlantic during the 16th and 17th centuries were concerned about witchcraft and sought to protect themselves and their property from witches. One way they did this was through creating witch bottles filled with biological material such as hair or nail clippings and bent pins or nails and placing them in their homes to trap evil spirits. This paper will discuss both colonial folk magic and the creation and implementation of the colonial archaeology activity.

Lockau, Laura (McMaster University)

[42] *Utility of the Zonation Method for the Study of Fragmentary, Commingled, and Disarticulated Human Remains: Cataloguing the Smith's Knoll Collection*

Bioarchaeological studies incorporate evidence and methodologies from a number of subfields, thus allowing researchers to take advantage of the strengths of approaches developed in archaeology for certain osteological applications. For describing and recording fragmentary commingled assemblages, traditional osteological techniques designed for use with complete skeletal elements and individuals are often ill suited. However, cataloguing techniques from zooarchaeology, in which these types of collections are more commonly encountered, can be productively adapted for use with human bone. One such recording system is the "zonation" method, adapted for use on human remains by Knüsel and Outram (2004). This technique divides each element into zones based on common postmortem breakage points. The zonation method was applied to the recording of the Smith's Knoll collection, a War of 1812 battle assemblage from southern Ontario, Canada consisting of fragmentary, commingled, and disarticulated skeletal remains. This method was found to be very useful for recording highly fragmented human skeletal material; however, as of yet it has not been widely adopted by bioarchaeologists. This poster outlines the utility of the zonation method in the cataloguing of the Smith's Knoll skeletal assemblage and consequently provides recommendations for bioarchaeologists wishing to use this method in the future.

[42] *Chair*

Lockhart, Jami, Scott Hammerstedt (Oklahoma Archeological Survey), Amanda Regnier (Oklahoma Archeological Survey), Patrick Livingood (University of Oklahoma) and John Samuelsen (Arkansas Archeological Survey)

[34] *Ongoing Geophysics, Mapping, Interpretation, and Testing at Spiro Mounds*

Past research and excavations at the prehistoric Spiro Mounds site have revealed isolated features and important artifacts, but have provided limited information regarding the site's intrasite organization. Building upon Dr. John Weymouth's geophysical surveys during the 1980s, the National Park Service held its 2004 non-destructive techniques workshop at the site. Recent broad-scale gradiometry, multisensor geophysics, mapping, aerial photo interpretation, and GIS development are providing additional insights into population density, structure size and type, activity areas, internal boundaries, site extents, cultural landscape features, and historic disturbances. To date, the geophysical survey covers 24 hectares. We present an overview with results, interpretations, and future plans.

Lockyear, Kris (Institute of Archaeology, University College London)

[34] *An Englishman Abroad*

From having contributed to the National Park Service's course in Remote Sensing in Archaeology for the last eight years, it appeared to the author that there are many differences between the practice of geophysics in the U.S. and in the United Kingdom (U.K.). These differences include the types of technique regularly applied, the mixtures of methods used, the aims and scale of the surveys undertaken, and the regularity with which surveys are undertaken. The question arises, however, as to whether the subjective impressions of an Englishman abroad represent reality, or whether the differences are less than they seem. This paper presents the results of an investigation into geophysical practice in the statutory, voluntary, commercial and academic sectors of archaeology in the U.K. and the U.S. It then goes on to speculate about why these differences have developed and it contributes to an understanding of the development of the discipline.

[34] *Chair*

Logan, Melissa (PaleoResearch Institute, Inc.) and Linda Scott Cummings (PaleoResearch Institute, Inc.)

[103] *Lava Tubes: Bird Habitat, Sweet Potato Gardens, or Something Else?*

Bashed lava tubes on the island of Hawai'i are common; however, their specific function is unclear. It is suspected they might have been used as bird nesting habitats, to create areas for sweet potato cultivation, or are the remnants of basalt collecting. Examination of organic residues in sediments recovered from in and around these features in the Pohakuloa Training Area in the saddle between Mauna Loa and Mauna Kea suggests bashed lava tubes in this area provided a bird nesting habitat, likely for the Hawaiian Petrel. In contrast, pollen analysis of four pits broken into pāhoehoe lava at an elevation of ca. 900 ft. AMSL in the North Kona district returned evidence of growing sweet potato in three of the pits. Differential use of pits exposed in lava tubes often requires examination of multiple data bases to determine their purpose.

Logan, Melissa [236] see Scott Cummings, Linda

Logan, Amanda (Indiana University) and Ann Stahl (University of Victoria)

[273] *Food (In)Security and Quality of Life in Ghana over the Last Millennium*

We investigate how quality of life and human security have changed in Banda, Ghana, as the area was drawn into increasingly global networks, from involvement in the Niger and

Atlantic trades to later become a periphery of the Asante and British empires. Our long-term case study compares shifts in productive activities, with a particular focus on foodways, agricultural and hunting practice. We document a real decline in standard of living and resilience to environmental change relatively late, beginning with a period of violence and dislocation in the 19th century and persisting to the present. Our study challenges notions of the fixity of African rural life, and shows how archaeology can add a valuable historical dimension to studies of food insecurity and sustainability. We further explore the value of our comparative approach for developing cartographies of human experience on a larger scale.

Lomayestewa, Lee Wayne [67] see Hopkins, Maren

Lombard, Marlize [98] see Pargeter, Justin

Lombardo, Robert [260] see Conlogue, Gerald

Longacre, William (University of Arizona)

[64] *Discussant*

Longhurst, Peta

[49] *The Foundations of Madness: The Role of the Built Environment in the Mental Institutions of New South Wales, Australia*

Institutionalization has been a widespread response to insanity since the eighteenth century. These institutions were highly ideological, and the psychiatric theory that informed them was inextricably bound up with notions of the 'ideal' built environment they should inhabit. However, both psychiatric theory and government legislation were constantly evolving, preventing the built environment from truly reflecting these social elements. This paper examines the role of the built environment in the function of mental institutions. The physical development of four institutions in New South Wales, Australia will be juxtaposed with the development of psychiatric theory and mental health legislation in order to reveal that the social and material components of the institutions did not correspond. This lack of correspondence is understood within a framework drawn from the work of Fletcher (1995, 2002, 2004) and Gieryn (2002). The built environment is an actor without intent, constraining the function of the mental institution and the behavior of its inhabitants. The institutions were modified materially in order to allow them to function, albeit not in the way envisaged by psychiatric theory. However, as theory continued to evolve, the resulting dissonance could no longer be mitigated against, leading to the eventual abandonment of the institutions.

Longstaff, Laura [128] see Sappington, Robert

Longstaffe, Fred [79] see Olsen, Karyn

Looper, Matthew (California State University-Chico)

[14] *Objects with Voices among the Ancient Maya*

Native notions of agency are particularly difficult to discern in archaeological contexts. In the case of the ancient Maya, the hieroglyphic script provides an important means of accessing these perspectives. The textual and pictorial record contains several instances in which objects such as musical instruments, shells, and masks were seen as persons capable of conversing with humans. These examples imply that the ancient Maya may have ascribed agency to the medium of sound, wind, or breath, independent of the human body. These concepts are compared

with Nahua (Aztec) beliefs, chronicled in colonial period documents.

Loos, Jordan [224] see Pike, Scott

Lopez, Julieta [63] see Kabata, Shigeru

Lopez, Cira Martinez

[145] *El ajuar cerámico de la fase Danibaan y los primeros siglos de urbanismo en Oaxaca*

La cerámica de la fase Danibaan (500-300 a.C.) muestra numerosas innovaciones en formas y decoración en comparación con la cerámica de la fase Rosario (700-500 a.C.), antes de la fundación de Monte Albán. Describimos las principales creaciones en la cerámica y los contextos en los cuales aparecen (unidades domésticas, entierro, tumbas, ofrendas y otros). Notamos, además, la distribución espacial de estos cambios en el Valle de Oaxaca y más allá y, finalmente, explicamos como los cambios en la cerámica reflejan las transformaciones económicas, políticas e ideológicas que caracterizan el urbanismo temprano en Oaxaca.

[145] *Chair*

Lopez, Larry (Yamagata University), Kazutaka Omori (Tokyo University), Masato Sakai (Yamagata University), Giuseppe Orifeci (Centro Italiano Studi e Ricerche Archeologiche Pre) and Minoru Yoneda (Tokyo University)

[214] *Impact of Past Climate Variability on Human Activities in Nasca, Peru*

The Pampas de Nasca is an extreme arid area with a mean annual precipitation of less than 10 mm. According to the available literature in the 5th century AD, human activities were abruptly affected by apparently severe climatic events. However, the information on long-term climate variability in this region is still limited. In order to provide an explanation about the drastic environmental changes that took place in ancient times, we investigate isotopic signatures recorded in modern and prehistoric tree rings of Huarango trees (*Prosopis sp.*) collected in Cahuachi. Oxygen, carbon, and nitrogen isotope ratio in the cellulose and lignin were measured in tree-rings. The variation in isotope ratios provides information on the changes in water and nitrogen source as well as water and nitrogen availability in the prehistoric wood samples. In the modern wood samples, environmental variability is registered in tree-ring growth and isotope ratios, providing a reference value for identifying drastic environmental changes in prehistoric times. Additionally, carbon and nitrogen isotope ratios of human remains provide a proxy for dietary patterns that appear to be associated with changes in environmental conditions suitable for the production of given food.

Lopez, Julieta (UNAM-ASU), Marina Vega-Gonzalez (Centro de Geociencias-UNAM), Manuel Aguilar-Franco (Instituto de Física-UNAM) and Jose Luis Ruvalcaba-Sil (Instituto de Física-UNAM)

[229] *Stones That Speak. The Slate from Calixtlahuaca: Sources, Function, and Distribution*

In this study we performed a comparative analysis of the origin, use, and distribution between Teotihuacan and Calixtlahuaca artifacts. For Teotihuacan, slate artifacts were considered as goods with a strong symbolic value, since they were used for about 900 years in funeral rituals. In its decline, the frequency of artifacts decreased and are concentrated in the older areas of interaction, such as the Toluca valley and Calixtlahuaca. These two societies used the slate artifacts within their offerings, showing a possibly ideological influence of Teotihuacan. However, it has been found that the valley had a particular dynamic resource supply. The origin of the Calixtlahuaca artifacts allows us to propose a supply route of raw materials. To identify the source slate of Calixtlahuaca, we applied techniques such as X-ray Fluorescence (XRF), X-ray diffraction (XRD) and SEM to some

artifacts and geological samples.

Lopez Corral, Aurelio (Instituto Nacional de Antropología e Historia) and Ramón Santacruz Cano (Instituto Nacional de Antropología e Historia)

[231] *Counterbalancing Tlaxcallan historical Records: The Archaeology of Noble Houses from Tepeticpac*

Political and economic power among Late Postclassic societies of central Puebla and Tlaxcala was strongly concentrated on the teccalli or noble house. Recognizing that the teccalli was a main element of indigenous sociopolitical organization has led to a major advance in our understanding of central Mesoamerican complex societies. However, our current knowledge of the noble house has derived largely from historical and legal documents written by Spanish and mestizos of the XVI century. Despite the importance of noble houses as key components of native altepetemeh or state-level polities, the relatively low information available from archaeological contexts strongly contrasts with that of the historical documents. This paper provides preliminary results from our recent excavations in noble elite compounds within the site of Tepeticpac, one of the major state level polities that formed the ancient republic of Tlaxcallan. Undoubtedly, this body of data will serve to compare colonial descriptions of the teccalli system with empirical evidence from the archaeological record and help broaden our understanding of the economic and social constitutes of prehispanic noble houses.

Lopez Cruz, Carlos

[107] *Investigaciones arqueológicas recientes en el río Santiago, Jalisco, México*

En los Últimos 10 años se han localizado más de 100 sitios arqueológicos a lo largo del cañón del río Santiago en el tramo comprendido entre la presa Santa Rosa y los límites con el estado de Nayarit. Los resultados obtenidos permiten sostener que el cañón estuvo habitado principalmente para el periodo posclásico y que la ocupación fue producto de una migración, se presentaran las características arquitectónicas de esta ocupación así como también sugerir que esta zona estuvo habitada por los grupos que participaron en la guerra del Mixtón en 1541.

López Luján, Leonardo [252] see Thibodeau, Alyson

Lopez Varela, Sandra L. [253] see Fischer, Christian

Lopez-Hurtado, Luis (IEP Instituto de Estudios Peruanos)

[108] *Archaeological Research Program IEP Peruvian Central Coast*

In this paper I will address the theoretical and methodological underpinnings that articulate our research program in the Lurín valley, Peruvian central coast. Research in this region has been traditionally focused on the religious site of Pachacamac. As a result different and sometimes contradictory scenarios about how the ideological ascendance of the coastal shrine influenced the social configuration of the Lurín valley during the late precolumbian periods have been proposed. I will elaborate on how in order to provide of a "bottom-up" perspective on the interaction between Pachacamac and the rural communities of the Lurín our research program pursues the evaluation of these models using data collected from one of these sites: Panquilma. To do so I will use data collected during the 2002, 2008 and 2012 excavations at Panquilma as well data collected from other contemporary sites in the vicinity.

[108] *Chair*

Lopez-Munoz, Marisol (University of South Dakota) and Matthew Sayre (University of South Dakota)

[180] Domestic Settlements and Production at Chavín

Recent research conducted across the river from the main temple at Chavín has focused on the interconnections between religion, economics, and the environment at the site. The central Andean region of South America was one of the few areas in the pre-colonial world where states and empires seemingly developed without markets and money. Yet, this distinct historical trajectory does not mean that exchange and production of material goods and technical knowledge did not play a significant role in these regional civilizations. The La Banda sector of the site, located across the Mosna River from the main temple, offers the best opportunity for researchers to gain insight into past production and exchange practices. Some of the best examples of manufacture/craft production areas associated with the site have been found here and further excavations will allow us to broaden these studies as well as providing context for studies completed until now. Research completed this last field season helped to define the areas of concentrated domestic settlements and we will present the results of these investigations as well as discussing future plans.

Lopiparo, Jeanne (Rhodes College)

[197] The Archaeology of Everyday Life at a Classic Maya Center, Chinikihá, Chiapas, Mexico
 The Late Classic Maya center of Chinikihá was part of a complex network of monumental sites that proliferated in the Chiapas Highlands during a time period that witnessed the maximal centralization of people and resources, which occurred in its most elaborate form at Palenque. The Proyecto Chinikihá de Arqueología Doméstica applies the theoretical and methodological approaches of the “archaeology of everyday life” in a region where fine-grained research can provide an essential complement to the macroscale analyses of settlement and social organization that have been predominant in the region. This approach focuses on the life-histories of residential groups through the detailed reconstruction of the traces of activities their occupants left behind — from the basics of cultivating, cooking, and eating, to the production of stone tools, pottery, and figurines, to elaborate feasting, commemoration of the dead, and participation in household and community rituals. This presentation focuses on the importance of understanding monumental centers not only through the highly visible statements of their rulers in the site cores but also through the extensive remains of their inhabitants, demonstrating how the results of fine-grained excavations contribute to understanding the life-history of Chinikihá and to integrating bottom-up, networked perspectives with regional macroscale analyses.

[197] Chair

Loubser, Johannes (Stratum Unlimited, LLC)

[18] Dark Hill of Omens, Hill of Seeking: Ethnography of Place and Petroglyphs in Hawai'i
 Near the west-central coastline of Hawai'i is a natural lava tumulus with two faint petroglyphs pecked into its upper surface. This tumulus is located not only on the transition zone between the coast and the interior of the island, but also on the boundary between two ahupua'a (traditional land divisions). The placement of the petroglyphs on an area of transition accords with the placement of other petroglyphs on the edges of natural zones, settlements, and features. Viewed in the light of their liminal placement and relevant ethnographic accounts, the petroglyphs visually represent the embodied self as a transition between ancestors of the past and offspring of the future. It was along the edges of the spirit world's "darkness," such as body extremities or landscape boundaries, where the mana-giving powers of the ancestors were most readily accessible.

Louderback, Lisbeth [87] see Spurling, Amy

Lourdeau, Antoine (Universidade Federal de Pernambuco)

[26] Advances in Lithic Technology of Prehistoric Hunter-Gatherer Societies in Central and Northeast Brazil

The question of the cultural features of the first prehistoric societies in Central and Northeast Brazil is often overshadowed by the debate about earliest settlements dates. Indeed, the area yielded some of the oldest archaeological sites of the continent, some of which internationally renowned. In contrast, the important mass of data about pre-ceramist period collected in the last decades is little-known outside Brazil yet. These archaeological data, however, are essential for understanding the settlement processes of this area. Lithic materials, quantitatively the main remains found in the sites, are very interesting for studying those first settlements. Our purpose is to expose the results of new technological analyses of the lithic industries from the region and to bring up their implications in terms of peopling processes. The ternary scheme proposed by P. I. Schmitz in the 1980's, distinguished (1) late Pleistocene productions, mainly on natural blank, from (2) early Holocene ones, characterized by unifacial shaping, a technical specificity, and from (3) mid-Holocene ones, when blanks were mostly undifferentiated flakes. The last studies tend to confirm this scheme, but these new data enable a finest perception of local specificities and a better comprehension of the connections between these phases.

Lovata, Troy (University of New Mexico)

[206] Carved Aspen Trees and Mountain Trails in New Mexico and Colorado: Landscape Archaeology at Three Sites in the Southern Rocky Mountains

Arborglyphs are the marks, writing, and images people carve into trees. Examples are found world-wide on a variety of tree species, but carvings in North America are most often encountered on aspens (*Populus tremuloides*). Scholars have tended to view American arbroglyphs as documents primarily meant to be read and interpreted, but archaeologists have recently focused on the context of these culturally modified trees. This paper discusses carved aspens and their relationship with historic and contemporary trails at three locales in the Southern Rocky Mountains. Surveys in 2011 and 2012 recorded both unique and ubiquitous arbroglyphs around Buckles Lake in the San Juan Range of Colorado, and alongside trails that cross the San Pedro Parks and overlaying the trail network below the Sandia Crest in New Mexico. This paper examines these sets of carvings as part of active cultural landscapes in which a century of Hispanic sheepherders, cowboys, hunters, outdoorsmen, recreationalists, and tourists of all stripes move between, stop among, and mark the trees. They indicate that culturally modified trees both reflect social contexts and people's movement as well as shape how people use the landscape to travel, make a living, formulate identity, and communicate across time.

Love, Michael (Calif State Univ-Northridge)

[4] Discussant

Love, Michael [171] see Borrero, Mario

Lowe, Lynneth (Centro de Estudios Mayas, UNAM)

[4] Discussant

Lowe, Kelsey and Lynley Wallis (University of Queensland)

[207] Understanding Magnetically Enhanced

Sediments in a Sandstone Rockshelter in Northern Australia

The application of magnetic susceptibility and mineral magnetic techniques have the potential to provide critical information for understanding complex stratigraphies of late Quaternary rockshelter sites in north Australia, specifically if they can be used to distinguish cultural from natural deposits. The outcomes from many rockshelter studies are often dissatisfied by unresolved questions relating to the complexity of sedimentation in stratigraphic units containing evidence for human occupation. One such site, Gledswood Shelter 1 (GS1) in northeastern Australia, has late Pleistocene-aged (i.e. ca 35,000 years BP) human occupation prior to and potentially through the Last Glacial Maximum (LGM); however, questions remain as to whether this site was occupied continuously, intermittently or abandoned through the height of the LGM. To address this issue magnetic susceptibility was used on the rockshelter sediments to better distinguish the stratigraphic sequence and to attempt to discern cultural from natural layers. When coupled with results from complementary methods that include geoarchaeology, soil chemistry and geochronology the data reveals that vertical patterns are evident at the site, potentially caused by both past human and environmental events. This preliminary study demonstrates the value of magnetic susceptibility for providing information regarding formation processes of significant Australian sites.

Lowry, Justin (George Mason University)

[171] *Preclassic Houses: A Study of House Form and Function in the Late Preclassic at Xuenkal*
Preclassic houses are important places to understand many aspects of social, economic, and political developments in the Ancient Maya. This paper discusses a Late Preclassic house-group at the site of Xuenkal, in the Yucatan Peninsula. With six structures, having three different construction styles, this house-group provides an interesting case to evaluate the changes and similarities in architectural and spatial traditions in an earlier Maya period. This group was occupied only during the Late Preclassic period. As such, the variation in construction can show us how certain types of architecture show different rates of stylistic change than others. Given the paucity of fully excavated house groups from the earlier periods, this study will add to understandings of house function and use in the Northern Maya Lowlands.

Lozada, Maria (University of Chicago)

[209] *Fact vs. Fiction: The Romantic Image of Field Schools*
Archaeological endeavors are often romantically portrayed in the media; however, undergraduate students in overseas field schools generally find that the actual practice of archaeology can be quite different. Archaeology requires not only academic and technical skills, but also patience, common sense and an understanding of cultural norms from the host country. Screening interviews prior to participation in field schools abroad commonly ask students to describe any experiences that simulate an archaeological dig, such as camping or wilderness living where there is limited access to basic American comforts. While these interviews provide prospective students with more realistic expectations for field work abroad, our experience after directing field schools for nearly a decade suggests that many undergraduate students still remain unprepared for their new academic experience abroad. To address this challenge, we developed several artificial scenarios that encourage students to develop more adaptive strategies to the difficulties of working in overseas field schools. In this paper, we describe this new pedagogic technique. We believe that it will help students arrive at field schools better prepared and give them the tools to evaluate their own efforts more objectively. Furthermore, it will help to ensure that the experience is more academically and personally fulfilling.

Lubinski, Patrick (Central Washington University), Karissa Terry (Central Washington University) and Patrick

McCutcheon (Central Washington University)

[147] *Are They Real? Distinguishing Flakes from Geofacts at the Wenas Creek Mammoth Site in Washington State*
The Wenas Creek Mammoth site is a late Pleistocene paleontological find with mammoth and bison bones dating about 17,000 CALYBP. Found in controlled excavations, two specimens resembling chipped stone flakes may or may not be associated with the bones. These possible artifacts are evaluated through three systematic tests. First, they are compared withdebitage attributes typically expected of artifacts and geofacts based on published experimental data. Second, they are compared in terms of nine of these attributes with a natural toolstone sample from the site excavation matrix. Third, these nine attributes are scored and graphed against those from the toolstone matrix sample and two samples of experimental flintknapped debitage assemblages. In all three comparisons, the specimens were more like artifacts than geofacts, suggesting that they are human-produced debitage, although their age is uncertain.

Lucero, Lisa (University of Illinois at Urbana-Champaign)

[49] *The Dissonance of Collapse: The Demise of Maya Kings and Perseverance of Farmers*
The build up of large, artificial reservoirs took place incrementally throughout the Late Classic (A.D. 550-850) at major centers in the southern Maya lowlands. The larger they became, the more people they could support and the more tribute rulers could collect. The system worked as long as there was adequate rainfall. When several multiyear droughts struck, things quickly fell apart—for kings. Farmers, however, had other options than just relying on reservoirs for their survival. They opted to abandon kings and centers to areas with enough water for their families and crops. In this paper, I discuss how the same material infrastructure impacted kings and farmers differently and how this dissonance bears on present concerns.

Lucido, Carlo (University of Central Florida), Sarah Barber (University of Central Florida) and Arthur Joyce (University of Colorado-Boulder)

[145] *Pottery, Feasting, and Urbanism in the Lower Rio Verde Valley, Oaxaca*
In this paper, we present the results of an analysis of pottery from six middens dating to the late Terminal Formative period Chacahua phase (A.D. 100 – 250) in the lower Rio Verde valley on Oaxaca's Pacific coast. It was during the Chacahua phase that the valley's most impressive monumental facilities were constructed at the urban center of Río Viejo. Five of the middens are from different parts of Mound 1, Río Viejo's massive public acropolis, and the sixth is from a ceremonial structure at the small outlying site of Yugüe. The goals of the study were to identify variability within public spaces on Mound 1 and to compare the non-domestic midden assemblages from the urban center with those of other sites in the region. Together, these data provide insights into the organization of commensal activities both within the early urban core and at a regional scale.

Lucido, Carlo [145] see Brzezinski, Jeffrey

Luke, Sean [23] see Rogers, J. Daniel

Luna Erreguerena, Pilar [109] see Rissolo, Dominique

Luna Golya, Gregory (Penn State University)

[208] *Late Aztec Settlement and Agriculture on Lake Xochimilco: Integrating Archaeological Data and Historic Landscape Imagery in a GIS*
Aztec water management transformed the dynamic shallow lake system that covered approximately 1,000 square kilometers of an

enclosed highland Mexico basin floor into the New World's most productive agricultural waterscape. The greatest expanse of wetland raised agricultural fields or chinampas were located in the southern Lakes Xochimilco and Chalco. Over the past 500 years the southern chinampa zone has significantly contracted with the drainage of the massive lake system and the falling water table accompanying rising urban water consumption. The extent of the Aztec lakebed chinampa system fell from memory until the 1960s and 1970s when survey and landscape archaeologists identified relic fields and Late Aztec sites throughout the drained southern lakebeds.

For the past 40 years, the lakewide chinampa model has been used for generating agricultural productivity models despite the lack of detailed data on the form and structure of settlement and agriculture within the ancient southern lakes. My project has integrated the original field maps from the Basin of Mexico survey along with 1936-1941 aerial photos for the entire Lake Xochimilco into a GIS. The resulting detail of the Xochimilco waterscape allows us to generate the first detailed spatial model of the ancient chinampa system.

Lundblad, Steven (University of Hawaii Hilo), Peter Mills (University of Hawaii Hilo) and Jennifer Kahn (College of William & Mary)

[62] *Determining the Extent of Intra- and Inter-Archipelago Exchange in the Hawaiian Islands Using Non-Destructive EDXRF*

The acquisition of geochemical data on thousands of archaeological and geological samples throughout the Hawaiian archipelago, coupled with analyses from other Pacific Ocean islands (Marquesas Is., Society Is.) analyzed with the same instrument and standardization procedure, allows for an analysis of the role of intra- and inter-archipelago exchange in Hawai'i. Adze quality archaeological material in Hawai'i generally clusters into recognizable geochemical compositions that can be compared to known geological source areas or inferred expedient quarrying activity, providing geochemical provenance information necessary for intra-archipelago exchange models. Among the findings established to date are 1) material from the Mauna Kea Adze Quarry (Hawai'i Island) was rarely exchanged as far as Kaua'i, but Mauna Kea material was commonly used in some elite contexts on Maui, 2) some island polities obtained nearly all of their adzes from outside political districts, while other districts with locally available adze quarries still regularly obtained non-local adze material, demonstrating the distribution of specific source material was driven by factors other than availability, and 3) we can document no extra-archipelago material thus far in the Hawaiian archipelago.

Lundblad, Steven [255] see Mills, Peter

Luo, Wugan [202] see Garrido, Francisco

Luo, Wugan (University of Chinese Academy of Sciences), Tao Li (Department of Anthropology, University of Pittsburgh), Francisco Francisco (Department of Anthropology, University of Pittsburgh) and Dongdong Li (Department of Anthropology, University of Pittsburgh)

[202] *A Portable Xrf Investigation of Archaeological Materials from Two Inca Smelting Sites in Northern Chile's Atacama Desert*

On-site nondestructive chemical analysis was performed on slags and minerals from two Inca smelting sites - Viña del Cerro site (VCS) and La Puerta site (LPS), in the Copiapó Valley of Northern Chile's Atacama region using a portable X-ray Florescence analyzer, trying to identify different activities (if there are any) related to copper smelting at a given site. The results revealed that: (1) Different copper minerals, some of which contain high level of arsenic (As), were mined for copper production by the Inca smelters. (2) High copper (Cu) and arsenic (As) were found in

slags from VCS. (3) Stone pieces with high iron (Fe) and low arsenic (As), possibly used as a building material for furnaces or as flux agent in the smelting process, were noticed in large quantities on both sites. (4) On the VCS site, soils within and around the furnace are quite high (up to 4000 ug/g) in copper; however, soils within and around the house structures are low in copper (less than 80 ug/g). Also interesting is that copper was noticed high in soils to the north and south of the smelting place, but low between the house structures and the smelting place.

Lupo, Karen [69] see Cooper, Catherine

Lurie, Rochelle (Midwest Archaeological Research Services, Inc.)

[119] *Almshouses, Poorhouses, and Poor Farms: The Oak Forest Institution, an Example from Cook County, Illinois*

During the 19th and early 20th centuries poorhouses and poor farms were seen as a way to accomplish many economic, disciplinary, rehabilitative, and humanitarian objectives. Many thought that pauperism, mental illness, intemperance, idleness, and ignorance were at their root environmental and could be eradicated by removing a person from bad influences and in some cases providing them with useful work. But these institutions also had the goal of reducing the cost of caring for paupers and discouraging people from applying for aid. These competing goals lead to the degeneration of poorhouses. However, some institutions built at the turn of the 20th century were influenced by Progressive Era movements attempting to bring about change on the societal and individual level by emphasizing hygiene, exercise, fresh air, good diet, sexual purity, and innovative medical treatments. Cook County's Oak Forest Institution, opening in 1910, provides an excellent example. Many of the patient and administrative buildings, designed by Holabird and Roche, and animal husbandry facility foundations are still present. Cemeteries, farmland and recreation areas were all part of the Poor Farm complex. Additionally, a wealth of information on 20th century diseases, their causes and treatments, and population demographics are preserved in Poor Farm/Hospital records.

Luscumb, Holly [6] see Lobiondo, Matthew

Luzzadder-Beach, Sheryl [213] see Beach, Timothy

Luzzadder-Beach, Sheryl (George Mason University), Timothy Beach (Georgetown University), Nicholas Brokaw (University of Puerto Rico Rio Piedras), Stanley Walling (Community College of Philadelphia) and Jonathan Flood (George Mason University)

[213] *Hydrological Investigations of the La Milpa, Dos Hombres and Chawak but'oob Archaeological Sites*

We present hydrologic research that is part of our interdisciplinary project to study the potential resilience and tipping points of society and the environment at the time of the Maya Collapse. Our study site is in the Programme for Belize Rio Bravo Conservation Area of Northwestern Belize. This site represents our best example of a post-Maya recovery landscape. Our goal is to develop a model of hydrologic opportunities and constraints on this biome's composition and resilience. The water supply for this region comes from rainfall runoff and perennial stream flow in the Rio Bravo. Groundwater of good quality also exists at some depth below in this karstic landscape, but it is mostly unavailable for biome support. The exception is in the form of springs at the base of the Rio Bravo escarpment. We monitored water quality to determine water supply suitability and also conducted soil infiltration studies along three transects. Infiltration characterizes hydrologic properties and limitations that soil types and slopes pose on this post-abandonment forest biome. Preliminary results

show few limitations imposed by water chemistry, and wide variability in infiltration rates.

Lv, Enguo [179] see Guo, Wu

Lynch, Sean (University of Alberta)

- [220] *Portable-XRF Characterization of Archaeological Obsidian from the Middle Jomon and Okhotsk Periods on Rebun Island, Hokkaido, Japan*

Ongoing excavations on Rebun Island in Northern Japan have demonstrated prehistoric use of obsidian persistently from the Middle Jomon to Okhotsk periods. Since obsidian does not occur naturally on Rebun or the neighboring islands of Rishiri and Sakhalin, only the transportation of raw material and/or finished tools over great distances accounts for their presence there. The nearest sources of obsidian are located on Hokkaido Island some 200 km away from Rebun, including separation by a 50 km stretch of the Sea of Okhotsk. Previous research in this region has shown that movement of obsidian from various sources on Hokkaido played a vital role in the entire lithic industry since the Paleolithic. As human mobility patterns varied in Northern Japan from the Middle Jomon and Okhotsk periods, the patterns of source exploitation are also believed to have changed. This expectation is tested by evaluating the sources of archaeological obsidian recovered from three archaeological sites on Rebun Island (Uedomari 3, Kafukai, and Hamanaka II) through portable-XRF. This method provides new insights into the dynamics of resource procurement and distribution among Middle Jomon and Okhotsk hunter-gatherers on Rebun Island.

Lynch, Daniel [276] see Becker, Rory

Lyons, Patrick (Arizona State Museum)

- [67] *The Davis Ranch Site: Archaeological Evidence of Kayenta Immigrants in Southeastern Arizona*

The Davis Ranch Site, located in the San Pedro River Valley of southeastern Arizona, was excavated by Rex Gerald in 1957, under the auspices of the Amerind Foundation. Although a draft report was completed in 1958, the data have never been published. This site, as well as the nearby and contemporaneous Reeve Ruin, yielded abundant and compelling evidence of immigrants from the Kayenta region of northeastern Arizona and southeastern Utah. Indeed, the evidence supporting a Kayenta presence at the Davis Ranch Site surpasses, both in quantity and quality, that recovered from the Maverick Mountain phase deposits at Point of Pines (the US Southwest's "classic" case study of how to reliably infer ancient migrations). In this paper, I report on a recently completed multi-year reanalysis of the Davis Ranch Site data. I also place the Davis Ranch Site – identified by Hopi cultural advisors as a kùuwa (ancestral Hopi village, literally "footprint") – in the wider context of late-prehispanic ancestral Hopi migrations and the Salado phenomenon.

M. Kemp, Brian [38] see Lenci, Eric

Ma, Xiaolin [219] see Pechenkina, Ekaterina

Mabry, Jonathan [291] see Ballenger, Jesse

Mac Sweeney, Naoise (University of Leicester)

- [287] *Conceptualizing Communities*

In archaeology, we have struggled with definitions of community. The community has been conceptualized as a natural social unit, the human correlate of the site; or as a form of social identity,

actively constructed through social practice and unrelated to geography. Imprecise terminology and modern political rhetoric further complicate the issue. I argue that communities in archaeology should be thought of as both geographic and social – as identity groups constructed through social practice, rooted in the landscape. Residential proximity and shared space are not determinants, but factors which enable a specific form of group identity to crystallize. This emplaced group identity become salient only at specific times for specific historical reasons, and must be enacted in social practice in order to crystallize. The social practices have been variously termed affiliation dramas, enactments of community, and practices of affiliation. They vary in form, but there are several recurring key features which construct collectivity rather than distinction, unity rather than internal differentiation. To date, studies of identity have focused on the boundaries of identity and the construction of the Other. However, the notion of the collective "Us" is also relevant and must also be socially constructed.

Macario, Raquel (Universidad de San Carlos de Guatemala / CEMCA-Guatemala)

- [140] *The Conceptualization of Space at the K'iche' Capital, Q'umarkaj, Guatemala*

The Late Postclassic of the Guatemalan Highlands is characterized as a period with strong social and political dynamics. The social complexity at the end of this period is well documented in the indigenous texts from the 16th century as well as through the supremacy of one of the major social groups of this time, the K'iche' Vinak. The social and political complexity detailed within these documents offer another dimension to the archaeological interpretation. Realized from the investigations at Q'umarkaj (2003-2007), the K'iche' capital, it was observed that the elite K'iche' lineages had a special handling and meticulous use of space in the construction of structures belonging to these lines; reflecting a systematic social and political ordering based on a complicated hierarchy. One of the most important architectural patterns from Q'umarkaj (Nim Ja and a temple) often differs in size, as well as in the level of their bases in relation to the level of the Plaza Principal, and their distance to the plaza. These data offer a chance to consider that at Q'umarkaj, the symbolism in the horizontal and vertical space added to the social and political settings of these tumultuous times in the Postclassic Highlands.

MacDonald, Brandi Lee (McMaster University), Martin Cooper (Archaeological Services Inc.), Fiona McNeill (McMaster University) and Joanne O'Meara (University of Guelph)

- [51] *Elemental Characterization of Pigments Used in Pictographs across the Lower Canadian Shield, Canada*

The Canadian Shield Woodlands area boasts rich concentrations of pictographs, and extensive efforts have been made to locate and document regional-scale rock art traditions. Research on these pictographs has focused primarily on interpretation of imagery and metaphor, and to situate them within a broader context of landscape archaeology (Arsenault 2004; Dewdney 1970; Rajnovich 1994). However, there has been a lack of research focus on the pigments that were used to create the pictographs. By analyzing the raw materials used we are able to glean further information on the activities surrounding the creation of pictographs and pigment procurement. We present the findings of a preliminary survey of the pigments used for rock painting concentrations in the Lake Temagami, Lake Obabika and French River areas of Ontario, Canada. By determining the geochemical signature of red ochre pigments, it is possible to identify variability in pigment sources used, and in some cases, to trace those pigments back to their geologic origin. We used non-destructive portable x-ray fluorescence equipment to geochemically characterize the paintings. Results show that multiple, distinct chemical groups of ochres were used within and between these areas.

MacDonald, Danielle [98] see Stemp, William

Macdonald, Danielle (University of Toronto)

[98] *The Effect of Use Duration on Surface Roughness Measurements of Lithic Tools*
 Previous experimental research has shown that laser scanning confocal microscopy has the potential to be a useful quantitative tool for the study of prehistoric stone tool function. This research has demonstrated that basic roughness parameters can characterize use-wear on lithic surfaces, distinguishing between different contact materials. However, further exploration is needed into the effect of use duration on worn lithic surfaces. Does worn surface texture produced by different contact material vary with duration of use? Understanding the changing nature of worn surfaces will help move the field of lithic use-wear quantification forward. This presentation will focus on a current program of experimental research that addresses how the length of use affects the surface characteristics of lithic tools. In this study, tools were used on several contact materials at increasing time intervals. Surface roughness characteristics were measured at each interval using a laser scanning confocal microscope. These experiments allow for the comparison of surface parameters over time on the same tool, tracing changes in wear on the tool surface. In this paper the results of this study are presented and avenues of future research that can contribute to the development of applied method in quantitative lithic microwear analysis are highlighted.

[98] *Chair*

MacDonald, Robert (University of Waterloo)

[257] *Public Issues Anthropology as a Framework for Teaching Archaeology and Heritage Resource Management*
 For humans, heritage is the nexus which connects the past with the future. A key component in the construction of identity—both individual and cultural—heritage is constantly being created and interpreted from information about the past. Archaeological anthropologists have traditionally focused on what the archaeological record can tell us about the people who originally created it and how we can use this knowledge to contribute to our social science. We have paid much less attention to how this information may affect living descendants of those ancient cultures. Increasingly, however, particularly where indigenous peoples are involved, we find ourselves confronted by descendant communities which view the archaeological record as an important part of their cultural patrimony and not the exclusive domain of professional archaeologists. This paper explores how the developing field of public interest/issues anthropology is being used at the University of Waterloo as a framework for teaching an expanding variety of professionals how to approach archaeology and heritage in ways that are holistic, transdisciplinary, respectful, and socially engaged.

MacFarland, Kathryn (School of Anthropology, University of Arizona)

[153] *The Anthropology of Unconventional Ideas*
 How well does archaeological inquiry incorporate historical description? Popular books such as J.W. Buel's 1889 *Sea and Land*, in which man-eating plants and women-stealing orangutans are described in great detail, are easily ignored as "weird." Descriptions of various historical groups, such as the Scythians, provided by Herodotus in *The History* (ca. 450 BCE) could be viewed with similar skepticism. For example, Herodotus described Scythian weather as so strange that feathers fall from the sky. Herodotus had apparently never seen snow. This description of foreign weather, while unconventional, is still useful to archaeological inquiry and, when contextualized, can help better orient archaeological study of a region. Unconventional ideas help anthropologists identify and delineate conceptual metaphors,

symbolic systems and general ideas that the writer has about the world or protohistoric subjects. Historical description is crucial in identification of material signatures of religious belief and landscape usage of historic and proto-historic peoples, and identification of social complexity, not obviously visible archaeologically. I propose that any culture's unconventional ideas, expressed in written documents and large scale patterned behavior, constitutes a robust line of evidence for anthropological inquiry, particularly when researching elements of social complexity, such as religious beliefs.

[153] *Chair*

MacFarlane, Gina [219] see Littleton, Judith

Macgregor, Oliver (Australian National University) and Alex Mackay (Australian National University)

[150] *Distinguishing Artifacts from Naturally Flaked Mimics, Using Flake Scar Size*

Collisions between rocks as they are transported by natural processes can create impact fractures that have Hertzian initiations and conchoidal shapes. These fractures are created by the application of force on a small area, and to this extent the fracture process is identical to the fracture process created by human knappers. Distinguishing natural flaking from human flaking is problematic, as natural collisions create flaked rocks that mimic cores. During a collision between two rocks, the energy available to initiate a fracture event is proportional to the mass of the rocks involved, as this affects their momentum and inertia. As a consequence of this, on rocks which are naturally flaked the size of flake scars should be correlated with the mass of the rock. We examine assemblages of flaked rocks from two environments in Australia where high-quality flakeable stone is abundant and ground surfaces are periodically flooded. Flake scar sizes are patterned according to the mass of the rocks they are on, and the association between these two archaeologically visible variables can be used as a means of distinguishing assemblages of naturally fractured rocks from artifactual cores.

Machado, Juliana (Universidade Federal de Santa Catarina)

[60] *Places of People: Women, Plants, and Exchange Networks on the Amazon Delta*

For the riverine of Caviana Island, on the Amazon delta, landscape is a social place and keeps the memory of the relation between the indigenous past and the riverine present. This paper deals with the relationship between plants and people. Planting is part of a set of practices, from obtaining the vegetal within the forest until its transformation into plant in the domestic environment. The forest is inhabited by enchanted beings and non-human mothers of places, beings capable of activating a process of transformation of the human to the one who charmed him. In this instability of the human condition, plants play a key role because they provide the healing of this spell, the reversal of this process, i.e. the possibility of permanence of their existence. By selecting and planting the women transform spaces into "places of people" through the exchange of plants and medicines among relatives, neighbors and friends. Exchange is an act of caring, which reaffirms the social bonds between humans and nonhumans engaged in reciprocal relations while binds them to specific places, reinforcing their sense of territoriality and belonging within the island.

Machicado, Eduardo (University of Cambridge) and Anna Browne Ribeiro (The Ohio State University)

[60] *The Many Faces of Amazonia: Reconceptualizing Scale, Dimensions, and Cultural Boundaries*

Amazonia, a region almost the size of Western Europe, has historically been treated as homogeneous. Archaeologists have attempted to create a Pan-Amazonian narrative, relying chiefly on

linguistic and ceramic data. These attempts have been hindered by the lack of solid chronological, stylistic, and spatial data available for this macro-region.

Every new research endeavor challenges our partitioning. As an example, recent work in the Llanos de Moxos, Bolivia, has shown more local diversity in settlement patterns and ceramic styles than previously known. Similarly, work in the Central Amazon has shown internal nuances in settlement and ceramic data, as well as connections to more distant parts of Amazonia. Intensive research has created the conditions for comparing and connecting these distinct sub-regions in the realms of subsistence practices and foodways, landscape transformation and management, spatial organization, and symbolic systems. In this session we explore historical and cultural connections across portions of Amazonia. Moving toward a new, dynamic synthesis of the culture history of the region, we draw upon locally developed data, creating a "mid-regional" scale that is defined by socio-cultural phenomena and chronological data, rather than by political, geographical, or other arbitrarily defined spatial boundaries.

[60] *Chair*

Macho, Gabriele

[215] *Moving West: The Dispersal of A. afarensis.*

The first unambiguous hominins are dated to about 4.2 Ma (*Au. anamensis*), and may perhaps be extended to 4.4 Ma (*Ardipithecus ramidus*). The hominin status of earlier finds, i.e. *Orrorin tugenensis* and *Sahelanthropus tchadensis*, is more contentious and these species are not commonly accepted as belonging to the hominin clade. Global environmental fluctuations and local habitat changes are thought to underlie the evolutionary pathway of hominins, as well as other mammalian groups, their movements and biogeography. The fossil remains of *A. bahrelghazali* from Chad at 3.0-3.5 Ma are limited and it is not certain that they are a separate species or merely a subpopulation of *A. afarensis*. Regardless, the western extension of this hominin is remarkable and requires closer inspection, especially so as this dispersal into Central Africa does not seem to be paralleled by other mammalian taxa, e.g. cercopithecines and carnivores. As our knowledge of Pliocene climate and vegetation in tropical Africa has improved considerably over the last few years, a new look at the dispersal of hominin is warranted. Here I will bring together the available information of climate, ecology and mammalian biography and appraise the selective forces that may account for the dispersal of *A. afarensis*.

MacInnes, Breanyn (Central Washington University) and Ben Fitzhugh (University of Washington)

[233] *Controlling for Landform Age when Determining the Settlement History of the Kuril Islands*

Archaeological investigations of human settlement patterns can be strongly biased by evolution of the Earth's surface in a dynamic landscape, such as the Kuril Island volcanic arc. Recent archaeological work in the Kurils established a chronology of human settlement heavily biased towards the later Holocene, necessitating inquiry into whether these settlement ages have been dictated by the age of the landform on which they rest. The bulk of earliest Kuril settlements date to the Late Holocene, younger than 4500 14C years B.P. Landscape-modifying geological forces that were active during settlement include eustatic sea level fall, tectonic emergence, volcanic eruptive processes (including lava, pyroclastic, and debris flows), coastal aggradation, and dune formation. In our analysis, we consider the impacts of these processes on archaeological records in the Kurils by comparing site occupation histories, using basal ages and pottery typology, with estimated landform ages. Out of approximately 100 sites analyzed, 30% were likely created since ~4500 years BP, 15% were earlier Holocene, 40% were Pleistocene or older, and 15% were of indeterminate age. These results show that while some minor bias can be expected, the migration record into the Kuril Islands is not constrained by

landform age at a majority of sites.

MacIntosh, Sarah (University of Nevada, Las Vegas) and Levent Atici (University of Nevada, Las Vegas)

[3] *Antlerworking at Körtik Tepe (SE Turkey) during Pre-Pottery Neolithic A (PPNA)*

Recent archaeological projects in southeastern Anatolia (Turkey) have shed new light on Neolithic archaeology and contributed to our understanding of the revolutionary changes in human lifeways during the Terminal Pleistocene and Early Holocene in the region. Körtik Tepe is one of the relatively new Pre-Pottery Neolithic A (PPNA; 10th millennium BP) sites excavated in the region with extraordinary findings. A most exciting and a rather unique aspect of Körtik Tepe is its fascinating mortuary practices. Körtik Tepe has not only yielded a large number of burials (currently over 400) with rich and diverse grave goods and sophisticated symbolism, but also round architectural structures (currently over 115). This paper presents the preliminary results of analysis on antler technology to add new data to ongoing zooarchaeological and archaeological research at Körtik Tepe. The antlers are both utilitarian and symbolic and ritual in nature, and we specifically seek to document antler use and technology during a period of rapid social, ideological, and economic change at the end of the Pleistocene.

Mackay, Alexander (Australian National University) and Emily Hallinan (University of Cape Town)

[28] *Provisioning Responses to Environmental Variation from MIS 4-2 in the Western Cape, South Africa*

The Western Cape of South Africa witnessed recurrent turnover of technological systems in the period from 75-20,000 years before present. This is also a period of rapid environmental change. In this paper we use data from open and shelter sites to examine differences in technological organization between industries such as the Still Bay, Howiesons Poort, post-Howiesons Poort and Robberg. We find that technological differences are underpinned by marked reorganization of provisioning systems, and discuss how these can be viewed as broad responses to local environmental variation through the late Pleistocene.

Mackay, Alex [76] see Nightingale, Sheila

Mackie, Quentin [137] see Orchard, Trevor

Mackie, Quentin (University of Victoria), Jenny Cohen (University of Victoria) and Daryl Fedje (Parks Canada)

[137] *Kilgii Gwaay: New Data from a 10,700-Year-Old Water-Saturated Site on the Northwest Coast of North America*

Kilgii Gwaay is a water saturated intertidal archaeological site in southernmost Haida Gwaii, British Columbia, which dates to a brief window around 10,700 cal. B.P. Joint excavations between the University of Victoria and Parks Canada in 2001 and 2002 recovered a large assemblage of stone tools and faunal remains, and a more limited but informative assemblage of perishable technologies made of wood, split root, and bone. The overall assemblage suggests interpretation as a summer base camp of people fully fluent in marine resources. Further work in the summer of 2012 has added significantly to the paleobotanical, lithic, and organic evidence from this site. These new data are the focus of this paper. We contextualize the new finds within the known faunal and lithic assemblages, and we discuss the implications of this wet site, one of the earliest of its kind in the Americas, for the early occupation of the Northwest Coast

MacLellan, Jessica (University of Arizona)

[78] *Early Households and Domestic Rituals at Ceibal, Guatemala*

Ceibal is a large Maya center located in the lowlands of Guatemala. The site was first occupied around 1000 B.C., at the beginning of the Middle Preclassic period. Structure 47-Base is a large platform near the site core. The platform supports a residential group and was first investigated by Gair Tourtellot in the 1960s, as part of his survey of the periphery of Ceibal. During the 2012 field season of the Ceibal-Petexbatún Archaeological Project, extensive excavations were carried out at Structure 47-Base. In addition to later material, Middle Preclassic house platforms, burials, caches, and activity areas were uncovered. The results provide new information about early domestic rituals and craft production. In particular, one Early Middle Preclassic (Late Xe ceramic phase) burial of multiple individuals is important to our understanding of mortuary practices at early Ceibal. Future investigations at Structure 47-Base will likely yield additional valuable data about the households of this era.

MacNeilage, Peter

[11] *On the Evolution of the Relationship between Speech Production and Body/Hand Control*
Speech and skilled right hand action are the two signatures of human output. Both are usually controlled by the left hemisphere of the brain. Manual gestures are increasingly implicated in language evolution scenarios. While considered unique to humans, both functions may be offshoots of a vertebrate-wide tendency for left hemisphere control of the body under routine conditions (MacNeilage et al., *Scientific American*, July 2009). In both functions, the evolutionary progression has been toward increasingly fine control of the terminal components of the two systems, the articulatory component of speech and the hand/finger component of the manual system. For speech the progression may have been evolution of syllable "frames" from the mandibular close-open oscillation of chewing, via monkey "lipsmacks", followed by programming of the oscillation with consonants (closing phase) and vowels (opening phase) (MacNeilage, *Behavioral and Brain Sciences*, 1998, 21, 499-511). Two stages in manual evolution may have been have been an early rightward whole body asymmetry, evident in marine mammals and the earliest primates (prosimians), and then right handedness, seen in fine skill components of manipulation, and bimanual coordination (e.g., in tool use), and gestural communication in higher primates (MacNeilage et al., *Behavioral and Brain Sciences*, 1987, 10, 247-263).

MacRae, Ian (Wilfrid Laurier University)

[259] *Diversity and Difference: Interpreting Naturalistic Miniatures in Dorset Archaeological Art*

Dorset art objects make up one of the premiere Canadian museum collection in any mode, form, or genre. These are priceless, irreplaceable artworks that deserve to be better known, appreciated, and understood. The contemporary context for the interpretation of Dorset carving begins with Swinton and Taylor's twinned, seminal papers in 1967, which championed "The Magico-Religious Basis" of Dorset Art. This remains the mainline of our understanding of what is in fact a highly differentiated material culture. This paper is based on research in major Dorset and Inuit museum collections in Canada and the United States. It suggests that such an interpretive paradigm, in which Dorset art is related to "shamanistic religious practices," that is, to totemism and sympathetic (primarily hunting) magic, often at least partially through ethnographic analogy with the historical Thule Inuit culture, works to reduce and overdetermine a marvelously complex field. Through analysis of an already recognized but under-interpreted mode in Dorset carving – the "zoomorphic series" of naturalistic carvings, particularly bears and seals – this paper posits alternative, possibly vernacular or quotidian, interpretations of a material culture that is often judged to be among the outstanding arts that the world has ever known.

Macy, Kimberly (University of Washington), Ben Marwick (University of Washington), Becky Song Hanyu (University of Washington), Cyler Conrad (University of Washington) and Alex Mackay (Australian National University)

[184] *Identifying Changes in Sediment Sources in Middle Stone Age Deposits Using ICP-AES at Klipfonteinrand, South Africa*

In this poster we present sediment chemistry data from Klipfonteinrand rockshelter, South Africa and nearby landscape locations. The aim was to determine characteristic elemental profiles for the major geological provinces surrounding the site and identify these profiles in the archaeological deposit. This allowed us to identify shifts in the source of sediments in the depositional history of the archaeological site. We used a modified EPA acid digest protocol to extract analytes for determination of elemental concentrations using ICP-AES. A series of clustering techniques followed by linear discriminant analysis were used to identify characteristic elemental profiles in the sediment samples and link the landscape samples to the archaeological samples. We found a clear shift in sediment sources during MIS 5 at Klipfonteinrand and suggest some links to other geoarchaeological data from the site and regional climate patterns.

Madden, Gwyn [38] see Karsten, Jordan

Madden, Gwyn (Grand Valley State University), Elizabeth Arnold (Grand Valley State University), Jordan Karsten (SUNY Albany) and Stanley Ambrose (University of Illinois, Champaign-Urbana)

[186] *Using Isotope Analyses to Examine Origins of Agriculture and Neolithic Farmers in Western Ukraine*

Verteba Cave is associated with the Trypolie culture in Ukraine, also known as the Cucuteni in Romania and Moldova. The cave, formed of gypsum, measures 8555 meters in length (Nikitin et al. 2010) with at least four areas from which human remains associated with the Trypolie have been found. Human activity at the site dates between 3951-2620 cal B.C. (Kadrow et al. 2003), with a peak in activity around 3500 B.C. in the area where the skeletal materials analyzed were recovered (Nikitin et al. 2010). It has been suggested that this peak in activity was associated with a decline in the local population. It is theorized that during this period immigrants were moving into the area bringing with them new technologies causing conflict or that local populations began warring over agricultural resources. Stable carbon and strontium isotope analyses were conducted on tooth enamel from three individuals in an attempt to identify possible migrants. Preliminary results show remarkably similar isotopic values and suggest that all individuals were from the same locality and shared a similar diet. Current analysis of shell samples is being conducted to establish a local baseline signature.

Magaña, Evelia [37] see Cucina, Andrea

Magill, Clayton (The Pennsylvania State University), Gail Ashley (Rutgers University) and Katherine Freeman (The Pennsylvania State University)

[172] *Plant Biomarker and Isotopic Perspectives on Early Human Habitats at Olduvai Gorge*

Sedimentary organic matter preserves a spectrum of ecological and environmental signals from the past. Yet these signals occur as a heterogeneous and complex mixture of molecular structures derived from many sources, including plants and microbes. Distinctive molecules derived from only ancient leaves – plant biomarkers – afford a means to circumvent this complexity, and are well preserved in lake sediments and ancient soils (paleosols).

Plant biomarker properties reflect the combined influence of botanical source, growth conditions and climate. Abundance and distribution patterns of plant biomarkers in modern plants are functions of both plant type (e.g., C3 vs. C4) and growth form (e.g.

woody vs. non-woody). Stable carbon- and hydrogen-isotope compositions (expressed as $\delta^{13}\text{C}$ and δD values) of plant biomarkers are sensitive to plant type as well as seasonality, water availability and canopy closure. Taken together, such data provide a framework for reconstructing terrestrial paleoecology that directly complements more traditional approaches.

Here, we will highlight plant biomarker signals from lake sediments and paleosols from Olduvai Gorge that inform our understanding of early human habitats. Our data illustrate the utility of plant biomarkers for reconstructing ancient habitats through time (catchment-scale) and space (microhabitat-scale) with focused regard for their wider application.

Magloughlin, Amara (Columbia University)

[134] *"Islands of Security," Islands of Terror: The Walling In of Palestine*

As the Israeli government continues to build the border wall separating Israel off from the Palestinians, it is essentially changing the Palestinian landscape into what can best be described as an island. This wall blocks the access of the Palestinians to roads and resources and forces them to adapt to a new terrain, isolated in the etymological sense of the word, "made into an island." Palestinian refugee camps in Lebanon are euphemistically referred to as "islands of security," insinuating that they are outside the control of the country's police, which is in actual fact false. What effect do these violent, political borders have on the identity of a culture? And to what extent does an analysis of Palestine and its camps as metaphorical islands, with continually adjusting territorial lines, open up or close down new lines of challenging the current political landscape?

Magoon, Dane [190] see King, Stephanie

Maher, Lisa (University of California Berkeley) and Margaret Conkey (University of California Berkeley)

[80] *Homes for Hunters? Exploring Hut Structures at Hunter-Gatherer Sites in Upper Paleolithic Europe and the Epipaleolithic of Southwest Asia*

In both Southwest Asia and Europe, only a handful of Upper Paleolithic/Epipaleolithic sites attest an aggregation of hunter-gatherer groups including evidence of individual dwellings, tents or hut structures. Paleolithic huts are depicted as mere shelters and ephemeral rather than as places 'built' into a landscape with meaning beyond refuge from the elements. In fact, this functional interpretation of shelters is embodied in the very terminology where mobile hunter-gatherers build and occupy huts that form campsites while sedentary Neolithic villagers occupy houses or homes that form communities. Here we examine the evidence for Upper Paleolithic and Epipaleolithic structures in Southwest Asia and Europe, offering insights into the complex 'functions' of hut or tent-like structures and examining perceptions of space between hunter-gatherers and later farming communities. We do this through recent examination of two contemporary, yet geographically and culturally distinct datasets: the Upper Paleolithic (especially Magdalenian) evidence in France and Epipaleolithic record (especially Kharaneh IV) in Southwest Asia. A comparison of the evidence for hut structures from these sites and regions suggests several similarities in both the nature of these huts, their association with activities related to hunter-gatherer aggregation, and their treatment by us in relation to later Neolithic homes.

[80] *Chair*

Mahoney, Shannon (College of William & Mary)

[115] *Post-Emancipation Community Building at Charles' Corner in Tidewater Virginia*

Immediately following the U.S. Civil War, social and political conditions on Virginia's lower peninsula facilitated the establishment of several African American settlements between

Hampton and Williamsburg. A study of one of these residential areas, Charles' Corner, allows us to examine the role of community building among rural African Americans following Emancipation and leading into an era dominated by legalized segregation. Ultimately, many of the African American residents on the peninsula were subject to mass displacement as the federal government commandeered land for both military and recreational use along the shoreline during the twentieth century. Nevertheless, fifty years of Charles' Corner history remains preserved in archaeological sites and recorded in the oral histories of former residents. This information presents an opportunity to examine the socioeconomic processes of establishing and maintaining these neighborhoods from the residents' perspective and provides data on the ways in which African American families organized and mobilized in the decades immediately following the Civil War and Reconstruction. The lives of rural African American residents at Charles' Corner also provide a narrative that contrasts with that of the more commonly related story of sharecroppers and tenants in the Jim Crow South.

Makarewicz, Cheryl [266] see Raad, Danielle

Makowski, Krzysztof

[132] *Staff Winged Gods and Noble Ancestors of the Wari Empire's Lords*

The author revisits the influential interpretation of the relationships between Wari and Tiwanaku, based on the typological study of comparative iconography - "one staff deity –one religion - one empire - one leader" - and discovers instead a great number of political actors, who are represented by their ancestors, and by remarkable diversity of staff deities, that looks like supernatural winged humans, felines, birds, fish, snails, and deer. These deities appear frontally or in profile, full body or just their heads, when they are represented in ceremonial clothes, vessels and ritual paraphernalia. Most of these deities have SAIS origin, but some other has central Andean features and attributes. The ceremonies honoring the ancestors were apparently the main scenario in which power relations acquired legitimacy, political rights was negotiated and hierarchical relationships within the lineage were sealed, as suggested by the results of W. Isbell's excavations in Conchopata and ours with M. Gierszy and P. Przadka in Castillo de Huarmey. The results of our study invite to reconsider the existence of the Wari ceremonial center in Pachacamac, but confirm the highest religious authority of Tiwanaku and his hypothetical solar god.

Malafouris, Lambros (Keble College, University of Oxford)

[14] *How to Think about the Self: An Integrative Perspective*

The question has been raised recently about how we go on reconciling anthropological and cognitive science notions of the 'self'. What I want to explore in this paper is how a relational ontology of extended selfhood can help us to achieve this goal. I will be asking two main questions: First, what is it like to be a person in a context where other than human entities are recognized as persons? Second, if we accept that selfhood is not something just located inside the individual, can it include material things as well? The empirical focus of my discussion will fall upon the long-term transformations and comparative examination of anthropologically recorded configurations of 'peripersonal space'—i.e., the activity space that immediately surrounds the human body.

Malagó, Aldo [224] see Araujo, Astolfo

Maldonado, Blanca (El Colegio de Michoacan, A.C.)

[59] *New World Metallurgy: A Comparative Study of Copper Production in the South Central Andes and West Mexico*

The development of technology in the New World followed its own path, both similar and different from that of the Old World. The knowledge of metallurgy and metalworking evolved and spread over much of the area occupied by high civilizations in the Americas. Having emerged in the Andean region of South America, metallurgy seems to have transferred from south to north, as far as Mesoamerica, where it developed into local technological traditions. Copper and its alloys have shown to be the material of choice for most pre-Columbian metallurgical industries. These materials were fashioned mainly as ornaments used in religious ceremonies and for the enhancement of elite cultural status. The archaeometallurgical record for this vast region, however, is fragmentary and dispersed. Most of the available information on metallurgical processes is largely based on metallographic analyses of finished products and thus, are often restricted to the final stages of production. The present paper attempts to comparatively study the complete metallurgical operational chain including ore sources, mining technology, mineral processing and extractive metallurgy, and structure the interactions among these aspects of production in different regions in South America and Mesoamerica, with an emphasis on the South Central Andes and West Mexico.

Maldonado, Ronald (Navajo Nation Historic Preservation Dept)

[123] *Navajo Cultural Affiliation Reach by Reach: A BOR Project in the San Juan Basin*

The Navajo Gallup Water Supply Project (NGWSP) is a 280-mile long pipeline that will bring San Juan River water to the Navajo Nation, Jicarilla Apache, and City of Gallup as part of the New Mexico Water Settlement. The Pipeline will be constructed on the northern, eastern, southern and western boundaries of the San Juan Basin. There will be numerous ancillary waterlines to serve Navajo communities within the Basin itself. An estimated 700-plus archaeological resources will be impacted by the construction of the project. The San Juan Basin plays an important role in Navajo beliefs, as within the Basin lie several clan origin places and ceremonial histories. More importantly, it is where the Navajo became Navajo. With the collapse of Chaco, oral tradition tells us that the Navajo abandoned the old ways (living in Pueblos) and began a new life. The project's massive size and the comprehensive sampling universe throughout the Basin provides the potential to answer some of the fundamental questions regarding Navajo origins and to evaluate the correspondence between Navajo oral tradition and the archaeological record of the San Juan Basin.

[174] *Discussant*

[152] *Chair*

Maldonado, Jesus [172] see Hofman, Courtney

Maley, Blaine (Des Moines University), José Capriles (University of Pittsburgh), Freddy Paredes-Ríos (Museo Nacional Paleontológico y Arqueológico de Tarija) and Bernardino Mamani (Museo Nacional de Historia Natural)

[38] *A Comparative Analysis of Two Early Holocene Human Skeletons from the Bolivian Andes*

Across the New World, human variation prior to the mid-Holocene is poorly understood due to the relative scarcity of archaeological sites with complete human skeletal remains. Additionally, the timing, size, and cultural attributes of the initial migrations for these early occupations are still unclear. Although there are a number of sites in South America with early human burials, there are few well-studied archaeological sites with human remains from the geographically complex Bolivian Andes. In order to improve our understanding of the initial process of human colonization in this region, this research presents the first comparative skeletal analyses of two complete early Holocene individuals from the Bolivian Andes: Nuagapua (Chuquisaca) and San Luis (Tarija). Analyses include demographic data and functional morphology

assessment, along with a discussion of their broader chronological, archaeological and paleoenvironmental context. Preliminary assessment of this material is consistent with the high variability characteristic of other early human groups occupying the New World during the early Holocene.

Maley, Blaine [38] see Maley, Blaine

Malloy, Maureen (Society for American Arch)

[269] *Who Are Archaeology's Interested Audiences? Data from Public Inquiries to the Society for American Archaeology, 2002-2012*

The Society for American Archaeology receives inquiries from hundreds of people each year that have some interest in the field of archaeology. Public inquiries come via email, phone calls, and snail mail; from students and teachers; from professional and avocational archaeologists; from both friends and foes of archaeology. What do these inquiries reveal about archaeology's interested publics? Who contacts SAA? What kinds of information do they seek? Has the nature of these public inquiries changed over time? How have Wikipedia and Google searches affected the types and frequency of public inquiries about archaeology? This poster will summarize and present research on archaeology's audiences based on 10 years of data collected by the SAA Manager, Education and Outreach.

Mamani, Bernardino [38] see Maley, Blaine

Manahan, T. (Kent State University), Mandy Munro-Stasiuk (Kent State University), Corrine Coakley (Kent State University) and Derek Salustro (Kent State University)

[125] *Evaluating Ground Penetrating Radar Identification of Architectural and Archaeological Features in a Karst Environment: A Case Study from Xuenkal, Yucatan*

This paper evaluates the accuracy and efficacy of GPR survey conducted prior to initiating excavations of Structure 9L-21 at the ancient Maya center of Xuenkal. Five hand-collected GPR 200 MHz grid surveys identified architectural features including masonry walls, entryways, floors, and construction pens. Other anomalies included burials, rock piles, and bedrock rises. These features were identified from 3D GPR models, and horizontal and vertical slices through the datasets. We examine the types of signatures identified by the GPR and compare them to what was revealed by the broad horizontal excavation area. Many anomalies, though not all, were confirmed, demonstrating the usefulness of GPR for identifying potential features prior to excavation. One drawback was inaccurate and often exaggerated depths of anomalies calculated by the GPR. Likely this was due to the GPR signal traveling through a mixture of matrices including air cavities in loose rubble and solid masonry and limestone blocks, each having distinct dielectric properties. Despite challenges of operating the GPR in a hot, humid, tropical karst environment on a loose limestone rubble surface, we conclude that the GPR method is excellent at detecting architectural and archaeological features, and thus allows for preliminary reconstruction of architectural details prior to excavation.

Mancini, María Virginia [28] see Franco, Nora

Mancini, Jason (Mashantucket Pequot Museum/UConn)

[223] *(Re)Collecting New England's Indian Whalers*

Though the age of whaling is long past, stories of Indian whalers persist today among New England's tribal communities as well as in other indigenous communities globally. Alongside

these memories are objects that tell of many other experiences and hint at a constellation of intercultural exchanges. In the early twentieth century, many of these "memory pieces" were acquired by outsiders and became part of Western museums and private collections. An unknown number of these cultural materials remain in the possession of Native families today. Most of these object histories have been subverted by the Western collection practice of detaching objects (whether viewed as art or artifact) from their cultural contexts and by marginalizing Indian histories that fall outside of anthropology's "ethnographic present." Though many of these objects have had their contextual histories compromised, it is the goal of this essay to recover and reconstitute these narratives. As points of contact, cultural exchange, and community memory, these objects, once reunited with local and tribal histories, reveal traveling histories that were, at one time, regular occurrences.

Mandel, Rolfe (Kansas Geological Survey)

[224] *The Application of Geoarchaeological Methods in the Search for Pre-Clovis Sites in the Central Plains of North America*

Archaeologists involved with the search for pre-Clovis sites are faced with a difficult task of locating what is likely a sparse, buried material record in vast, complex late-Quaternary landscapes. Using the results of recent geoarchaeological investigations in the Central Plains of North America, this paper demonstrates how archaeologists can focus their search by adopting a systematic geomorphological approach that considers differential preservation of sedimentary deposits in valley landscapes. Because pre-Clovis sites will occur only where there are deposits old enough to contain them, determining the numerical age and spatial pattern of those deposits has been an important aspect of the studies in the Central Plains. This has involved geoscientific methods, including soil-stratigraphic analyses of natural outcrops with thick deposits of alluvium and loess, to locate buried pre-Clovis-age landscapes represented by paleosols. Also, coring with a hydraulic soil probe has been employed where outcrops are absent. Localities with sedimentary deposits dating to ca. 20,000-13,500 cal. yr B.P. have been the targets of deep archaeological testing, resulting in the discovery of two sites that appear to contain pre-Clovis cultural deposits.

Mandell, Elisa (California State University, Fullerton)

[57] *Beyond Death: An Analysis of Secondary Burial Practices in Costa Rica*

Originating from the area of Greater Nicoya, Costa Rica, a small group of ceramic masks (ca. 1-500 C.E.) shares unique qualities that distinguish them from other Pre-Columbian masks. Combining selective naturalism with abstraction, the masks depict an important biological and spiritual event: the transformation from life to death. In particular, I argue that these Costa Rican masks are distinctive in their portrayal of the postmortem biochemical events that accompany death, and in the high degree of accuracy used to communicate the complex series of physical changes that occur during decomposition. Observing and documenting the stages of putrefaction would have been important in cultures practicing secondary burial, where decedents experience two funerals. The tradition of secondary burials in this region is corroborated by the excavation of La Regla (ca. 500 B.C.E.), a cemetery located on the Nicoya Peninsula. Exploration of cross-cultural examples of secondary burial sites elsewhere in the Americas will elucidate the significance of this practice, as well as that of the role of the masks in ancient funerary rituals. Understanding what these Costa Rican masks may have meant to those who created and used them also relies on ethnographic and ethnohistoric studies of the indigenous Costa Rican Bribri.

Manguin, Pierre-Yves (Ecole française d'Extrême-Orient)

[104] *Regional Religious and Trade Networks in Early Historic Southeast Asia: A Pan-Regional Process*

Combining data collected from fieldwork in three coastal regions (Mekong delta, West-Java and Southern Sumatra) with reassessments of earlier dogmatic interpretations by archaeologists and historians, this presentation will attempt to show how integrated, multi-cultural Asia-wide trade and religious networks contributed to early state formation processes in early historic Southeast Asia.

Mankel, Magda

[121] *Undocumented Migration, Boundary Enforcement, and Contemporary Archaeological Sites: Understanding the Modified Southern Arizona Landscape from the Perspective of Locals*

Since the implementation of the border enforcement strategy known as "prevention through deterrence" in the 1990s, the southern Arizona desert has served as a major gateway for undocumented migrants seeking entry into the United States. Over time, increased migrant traffic and border patrol surveillance have significantly modified the wild lands of southern Arizona. Such modifications include increased numbers of pedestrian and off road vehicle trails, the destruction of vegetation, the disruption of wildlife habitats and cattle ranching, and the creation of "migrant stations" (i.e., areas where border crossers rest and leave behind objects). Using a combination of participant observation and interviews with humanitarian workers and local residents, I outline and explore the broad range of behaviors, interpretations, and meanings that people generate as they interact with objects at migrant stations and the southern Arizona landscape. I argue that migrant stations, along with other modifications to the environment resulting from boundary enforcement have fundamentally changed the way many people conceptualize the "natural" environment of the region. Moreover, I posit that work focused on the emic perspective of local border residents provides new and important insight into people's perceptions and understandings of place, migration history, and the formation of archaeological sites.

Manne, Tiina (University of Queensland)

[69] *Indirect Evidence of Small-Scale Storage at Vale Boi, an Upper Paleolithic Site in Southwestern Iberia*

Rendering grease from animal bones may represent some of the earliest indirect evidence for small-scale, long-term storage. Recognizing grease-rendering in faunal assemblages is challenging, as the practice can be mimicked by a number of other taphonomic processes. In this poster I present taphonomic and zooarchaeological analyses used to identify grease-rendering at Vale Boi, an Upper Paleolithic site in southern Portugal. This includes documenting taphonomic evidence such as percussion marks in the form of dents, crushing and cone-fractures, as well as investigating patterns of bone loss through multiple lines of evidence. The results of this multidimensional study strongly suggest that horse and red deer at Vale Boi were rendered for their grease, already in the early Gravettian (ca. 28, 000 B.P.). Ethnographic studies and historical documents provide us with an understanding of the varied uses of bone-grease in the recent past, but also indicate the significance that a light-weight, calorie-rich resource would have represented for small, mobile groups in antiquity. Bone-grease may have had a variety of uses at Vale Boi, including equipping long and short-distance trips with a highly portable, nutritious resource; mitigating short or long-term resource-risk; and acting as a valuable, exchangeable surplus.

Manning, Steven J. [51] see Hurst, Winston

Manolakakis, Laurence [39] see Bellot-Gurlet, Ludovic

Manolakakis, Laurence (CNRS) and Olivier Weller (CNRS)

[96]

Emergence of Social Hierarchy in Europe (ca. 4600 B.C.): Just before Varna, Salt Cakes and Flint Blades

Although signs of durable social hierarchy are clearly visible in the Karanovo VI / Varna period, a number of economic and symbolic traits emerge earlier and are archaeologically visible in the preceding period. The Balkan Chalcolithic is characterized both by technological innovation (copper metallurgy, gold-working, graphite decoration, lever pressure debitage, salt cake production etc.) and by upheavals of economic and social nature (regionalized production; long-distance exchange, durable and hereditary hierarchy). Cemeteries on the Bulgarian coast, and especially Varna, concentrate products in ostentatious and spectacular manner, suggesting particularly large-scale patterns of circulation.

Well-established for the Varna Culture, these changes do not appear suddenly at this time. They are in fact the outcome of transformations that gradually emerged during the previous period (Karanovo V / Hamangia IV). Our aim here is to compare two special productions, very long flint blades and moulded salt cakes, both of which are well-documented in terms of sources and manufacture. The confrontation will examine modes of production, as well as the economic and/or symbolic value of the goods, within a chronological framework that is sufficiently broad to enable a dynamic approach to change in north-east Bulgaria in the first half of the 5th millennium.

Mans, Jimmy L.J.A. [292] see Siegel, Peter

Mant, Madeleine (McMaster University)

[42]

Bioarchaeology and Perimortem Trauma

Perimortem trauma is difficult to identify unequivocally and has been a challenging topic for physical anthropologists since the earliest studies of skeletal trauma. Use of the biocultural perspective in conjunction with the inclusion of forensic and clinical technology and methodology increasingly gives bioarchaeologists greater means to develop a comprehensive picture of trauma in the past. New types of technology, such as 3D scanning microscopy, provide a way forward for studies of perimortem trauma in bioarchaeology through the production of digital images with precise morphological information. Further, incorporating historical and cultural information into trauma research through invoking the biocultural approach allows for deeper understandings of individuals' lived experience to be interpreted. It is also worth noting how bioarchaeology employs ethics along with respect for the individuals being studied, making this field a prime contributor to studies of perimortem trauma in past communities. By incorporating historical and cultural context with data derived from contemporary technology bioarchaeology is uniquely suited to contribute to investigations of perimortem trauma in past communities.

[42]

Chair

Mant, Madeleine [42] see Lockau, Laura

Manzanilla, Linda [17] see Casar, Isabel

Manzanilla, Linda (U Nacional Autonoma de Mexico)

[17]

Funerary Patterns, Sex and Age Profiles, and Activity Markers of the Teopancazco Individuals at Teotihuacan

In this paper, Luis Adrián Alvarado and Linda R. Manzanilla will review the different funerary patterns, age and sex profiles, and activity markers of the 116 burials at Teopancazco, a multiethnic neighborhood center of Teotihuacan, located in the southeastern sector. The intermediate elite that headed this neighborhood center fostered caravans to the Gulf Coast to obtain 12 varieties of

fish, crabs, turtles, crocodile; cotton cloths, pottery and other items. Other individuals were incorporated into the caravan coming back to Teotihuacan, when stopping in the corridor of sites in Hidalgo, Puebla and Tlaxcala.

The Teopancazco individuals display patterns that are not found in apartment compounds of the metropolis: a third of the burials are decapitated individuals (most of them in a termination ritual dated in AD 350); another third are infants (mostly new-born babies). The adults are mainly males, with less than 10% of females, which emphasizes that Teopancazco is not a residential compound, where males and females are equally represented.

The activity markers studies by Luis Adrián Alvarado relate some of the individuals with manufacturing activities such as sewing, fiber-working, other activities such as walking for long distance or carrying heavy weights are attested.

[17]

Chair

Marabea, Christina [288] see Gilstrap, Will

Marciniak, Arkadiusz (Institute of Prehistory, University of Poznan)

[32]

The Nature of Household in the Upper Level at Çatalhöyük: Smaller, More Dispersed, and More Independent Acquisition, Production and Consumption Units

The nature of household and farmstead in the upper levels at Çatalhöyük: smaller, more dispersed and more independent acquisition, production and consumption units. The final occupation phases at Çatalhöyük East mark a significant departure from the hitherto dominating neighborhood community as an organizing principle of the local society and signal the emergence of autonomous differentiated households. The paper will address multiple lines of evidence to explain the emergence of this new social system, its nature and mechanisms, and its consequences for the development of fully-fledged farming communities in the region and beyond. High resolution archaeological and archaeobiological data permit tracing changes in procurement, production and consumption during this period. In particular, new strategies for the acquisition of clay for mudbrick production and wood for fuel and fodder reveal changes in land use around the site. These patterns are supported by the recognition of new modes of caprine herding evidenced through oxygen isotope analyses. Changes in the consumption regimes will be investigated by wood use, house building, and eating practices.

[32]

Chair

Marcone, Giancarlo

[61]

Feasting and Burials in Local Communities at the Onset of the Andean Middle Horizon

Drawing from ethnohistorical sources, many Andean scholars have modeled Inca expansion as a highly ritualized political process, where feasting and ritual performance constitute its principal components. This model had been projected onto all Andean societies assuming that feasting activities played a similar political role and importance in older societies. Other voices propose that burial practices and ancestor veneration were also of central political importance in the Andean states' expansionist projects. Ancestor veneration was thought of as the ideological base that upholds these entire systems. Increasingly, new voices are proposing that ancestor veneration and burial practices need to be understood in relation to feasting practices. It is only in this relational way that we can fully understand their political and social meanings. I propose that this is particularly true in the cases where local communities interact with expansionist polities. We propose from the evidence of Lote B, a small rural settlement in the Lurín valley, that the increase of feasting activities is related to the suppression of funerary practices or vice-versa. This inverse relation could inform about the nature of an expansionist project,

but also the compromise that takes place between local communities and expansionist polities in turn.

[108] *Discussant*

Marcucci, Derrick (Landmark Archaeology, Inc.) and Susan Gade (Landmark Archaeology, Inc.)

[92] *The Archaeology of a World War II Bombing Range in Southeastern New Hampshire*

Cultural resource management support was conducted by Landmark Archaeology, Inc. for a major environmental restoration program at the New Boston Air Force Station. The Station, located in south-central New Hampshire, encompasses over 2,800 acres and comprises one of the state's most archaeologically rich areas. It includes pre-Contact indigenous sites, the remains of a farming community spanning the 18th to early 20th centuries, and a wealth of materials related to its use by the U.S. Army Air Force as a practice bombing and strafing range during and after WWII. The military chose New Boston for its strategic location and unique landscape features, which provided an ideal setting for training fighter pilots. Munitions and unexploded ordnance prohibited the use of traditional archaeological survey methods. We employed a combination of UXO-escorted survey, photography and GPS to document existing cultural resources and record military use of the station. Analysis of our spatial data using GIS provided insight to the ways that the natural and cultural landscape was used and altered by military training activities and allowed for identification of unrecorded archaeological sites reflecting the station's agricultural and military history.

Marean, Curtis [10] see Fisher, Erich

Marek-Martinez, Ora (Navajo Nation)

[174] *Scales of Consultation: Multiple Stages of Listening and Learning in the Navajo Nation*
Almost all federal undertakings on the Navajo Nation initiate the Section 106 process, which includes consultation with the NNTHPO (HPD). Rarely will this consultation go beyond the Navajo Nation's regulatory department- HPD. Various mechanisms are used by other departments to consult with Navajo communities which have a diverse range of opinions, but rarely are community concerns heard when consulting strictly with the THPO (HPD). This lack of communication between the central government and Navajo communities has created a 'top-down' attitude and process when managing cultural resources that sometimes creates conflict with local residents. Additionally, each community views archaeology and CRM through different lenses, which can complicate consultation and project efforts. In this paper I will discuss my experiences consulting with Navajo communities, what has worked and what hasn't, and to provide recommendations to ensure that the voices of tribal communities are heard.

Marguerie , Dominique [137] see Steelandt, Stéphanie

Maric, Tamara (Laboratoire de recherches Ethnologie Préhistorique ArScAn (UMR7041))

[274] *Examples of Settlement Patterns in Pre-European Tahiti (Society Islands, French Polynesia)*

Ancient Tahitian society was considered one of the most stratified among Polynesian societies. And while several ethnohistorical analyses describe the complex social classes and inter-related chiefdoms of the islands, very little archaeological data concerning settlement patterns on the island of Tahiti are known. This presentation examines different cases of settlement patterns on the largest island of the archipelago, in littoral zones, valleys and high mountains. These settlement patterns are drawn from archaeological data from the south-western zone of Tahiti (Teva i Uta chiefdom), and from the Papeno'o valley in the northern part of the island. Distribution of lands and natural resources will be

examined according to the status of social groups - inferred from both archaeological and ethnohistorical data. Settlement patterns reflect variable situations, which could have resulted from different environmental conditions and different degrees of stratification of social groups, related to the historical trajectories of chiefdoms.

Marichal, Ana [260] see Brownlee, Sarah

Mariela, Carpio [168] see Scheinsohn, Vivian

Mark, Robert [18] see Billo, Evelyn

Mark, Robert (Ruperstrian CyberServices) and Evelyn Billo (Rupestrian CyberServices)

[18] *Using iPads for Rock Art Documentation*

As part of a Bureau of Reclamation project to document petroglyphs at the Watson site in eastern Oregon, we developed and tested procedures for the use of iPads. The centerpiece was the development of a Filemaker Pro database, deployed with Filemaker Go on the iPads. The database implemented the recording form, as well as panel images and maps. It included a mug board for DSLR photography. We also used the Theodolite HD application to capture images with GPS location and panel orientation in the photograph. Tests were also conducted with drawing applications to trace over photographs.

Markens, Robert

[145] *Ceramic Imagery and Political Power at Early Monte Albán, Valley of Oaxaca*

The basis of political power during the first centuries of Monte Albán, one of Mesoamerica's earliest urban centers, is a difficult topic to address. Apart from the Danzante Wall and the Víborón sculpture, early public monuments and their imagery have remained inaccessible beneath later stages of construction. There is, nevertheless, another extensive source of information that can shed light on the matter and which has received little systematic attention until now (Markens 2010). These are the numerous tomb and grave offerings dating to the Middle and Late Preclassic periods that Alfonso Caso and his colleagues (Caso and Bernal 1952; Caso, Bernal and Acosta 1967) excavated decades ago at Monte Albán. The many ceramic offerings, their novel imagery and their distribution in tombs and graves appear to relate to emerging social differences and the exercise of power. Here I report on some aspects of this imagery, its meaning and relationship to political power during the first centuries of urban life at this ancient Zapotec center.

[145] *Chair*

markens, robert [252] see Winter, Marcus

Marks, Theodore [11] see Enloe, James

Marquez Morfin, Lourdes [46] see Storey, Rebecca

Marquez-Grant, Nicholas (Cellmark Forensic Services, UK and University of Oxford, UK)

[135] *Forensic Case Studies from the UK: Archaeological Contributions to the Search, Location, Excavation, and Recording of Clandestine Graves*

A number of case studies in forensic archaeology particularly from England are provided here. In particular, the role of the forensic archaeologist in the search, location, excavation and documentation of clandestine graves is discussed. The integration of archaeology with anthropology and other environmental

sciences (palynology, sedimentology) in death investigation are also highlighted and it is hoped that these case studies and discussion can contribute towards promoting the discipline of forensic archaeology.

Marquez-Morfin, Lourdes (Escuela Nacional de Antropología e Historia INAH)

[46] *The Epidemics of Typhus and Cholera in the City of Mexico in the Nineteenth Century: A Reflection of Social Inequality*

Studying infectious and epidemic diseases are an excellent tool to analyze and evaluate the relationships between society and health. The impact of infectious diseases was differential depending on the socio-economic and ethnic groups. In the case of outbreaks of 1813 typhus and cholera in 1833 that afflicted the inhabitants of the city of Mexico, its effects were not similar among the entire population. Social stratification as a product of inequalities had a decisive role in the way in which ethnic groups became ill and died. This paper describes the factors involved in causing individuals to get sick and die differentially, with respect to their material conditions of existence, to health services availability, and their biological conditions. From archival documents as primary sources of information, we discuss the city's infrastructure in relation to health, networks of water and hygiene, and the distribution of the ethnic groups in the city. We present results on differential morbidity and mortality, according to the distribution of these groups in the city, for each of the two epidemics. Data reveal the negative impact that the precarious socio-economic conditions of indigenous people and poor groups of the city had before the onslaught of these two epidemics.

Marsh, Ben [65] see Kealhofer, Lisa

Marshall, Amanda (Kleanza Consulting) and Jennifer Lewis

[262] *Salvaging the Past, Bridging the Present at Cedarvale, BC*

This paper will present the results of salvage excavation of a large prehistoric site located on the Skeena River, near Cedarvale, BC. This excavation was undertaken in conjunction with the Gitxsan First Nation, and involved a team of people from diverse backgrounds: students, community members, volunteers and consulting archaeologists. This presentation will discuss the significance of this site, both scientifically, as well as culturally. The unique educational and team-building aspects of the project will also be discussed, and suggestions will be made for how similar projects may have an important role to play in the future of consulting archaeology in BC.

Marston, John (Boston University)

[183] *Agricultural Adaptation to Highland Central Anatolia: New Data from the Iron Age City of Kerkene*

Adapting agricultural systems to new environments poses challenges to societies of all scales. High altitude environments in particular offer significant constraints to agriculture, with shorter growing seasons, cooler temperatures, and differential rainfall affecting the success of certain crops and farming strategies. Comparative analysis of agricultural societies moving into high altitude regions for the first time offers a valuable perspective on social processes of economic adaptation and on the environmental impacts of human land-use strategies across different climatic zones.

Archaeological plant remains from new excavations at the Iron Age city of Kerkene, in central Anatolia (modern Turkey), provide the first data on agricultural adaptation to high elevation conditions in that region. Preliminary analysis of remains recovered over two field seasons suggests a reliance on bread or hard wheat as the primary crop, in contrast with more diverse economic system seen

at contemporary sites at lower elevations. There is little evidence for the use of dung fuel and a greater reliance on wood for fuel needs, leading to different harvesting pressures on local woodland resources. This poster explores the implications of these preliminary data for future work in this region and for the comparative study of agricultural adaptation to new environments worldwide.

Martin, Fabiana María (CEHA-UMAG), Francisco Juan Prevosti (División Mastozoología, Museo Argentino de Ciencias), Charles R. Stern (University of Boulder-COLORADO), Manuel San Román (CEHA-UMAG) and Flavia Morello (CEHA-UMAG)

[26] *New Late Pleistocene Faunal Evidences from Cerro Benítez, Última Esperanza, Chile*

A recent archaeological survey at Cerro Benítez, Última Esperanza, Chile, revealed abundant evidence about the archaeology and paleontology at the end of the Pleistocene. Six new sites were added to four that were already known. A tephra identified at four of these sites, which are located at different altitudes, was previously fingerprinted to an explosive eruption of the Reclus volcano dated ca. 12,600 radiocarbon years ago. A rich fauna, dominated by Mylodon darwini -which is present at the ten sites- Hippidion saldiasi, Panthera onca mesembrina and camelids was recorded immediately below, and sometimes embedded in the tephra. At least two of these sites can be interpreted as extinct carnivore dens. Human presence was identified above this tephra, in one case with dates around 10,500 radiocarbon years and associated with extinct fauna.

Martin, Fabiana [26] see Morello Repetto, Flavia

Martin, Lucius (University of Oklahoma), Liana Staci Hesler (University of Oklahoma) and Andrew Gourd (University of Oklahoma)

[169] *Success and Challenge: A Survey of Tribal Historic Preservation Offices within Oklahoma*

The 1992 Amendments to the National Historic Preservation Act established the Tribal Historic Preservation Program and gave tribal nations the authority to take over aspects of the State Historic Preservation Office regarding historic preservation on tribal lands. As of May 2012 there were 131 formal tribal historic preservation officers in the United States; as of September 2012, 12 of Oklahoma's 39 federally recognized tribal nations had undertaken this role. We surveyed the Tribal Historic Preservation Offices within the state of Oklahoma in order to get an idea of their current state of affairs and their interactions with Federal Agencies, CRM Firms and Archaeologists. We will report on the process and results of that survey here.

Martin, Lana (University of California Los Angeles)

[217] *Modeling Political Organization and Food Production in Middle-Range Societies: A Case Study from Panamá*

Explaining the nature and development of political organization in pre-Columbian chiefdoms (ca. AD 300 to 1500) of Central Pacific Panamá (Gran Coclé) and Western Caribbean Panamá (Gran Chiriquí) has been the aim of archaeologists working in the isthmian region. One model of economic development and regional interaction portrays Gran Coclé as a central core flanked by peripheral Gran Chiriquí settlements. Another model proposes that different societies at different levels of political organization (tribes and chiefdoms) co-existed in both Pacific and Caribbean watersheds. Current approaches to modeling the Panamanian interaction sphere rely on untested assumptions about plant food use in middle-range societies, implying demographic variability was driven by regional differences in rainfall, biogeography, and potential maize yield. This paper reviews these models in light of available settlement, subsistence, and paleoenvironmental data. In addition, this paper considers models of political organization and food production applied to other middle-range agricultural societies

in the New World, and presents a theoretical framework that draws upon the "historical processualism" paradigm, "historical ecology" research program, and "chiefly cycling" model. This framework offers potential for analyzing multiple lines of evidence and accounting for the ecological and social factors that led to variability in the chiefdoms of ancient Panamá.

Martin, Debra (University of Nevada/Las Vegas)

- [273] *Can We Feel (Measure) Pain from the Bones? A Bioarchaeological Perspective*

The human experience of pain and suffering is difficult to measure on living, breathing humans who can articulate what hurts and how much it hurts. And, new research in neurophysiology suggests that pain receptors can be altered by life history, lived experience (culture) and individual anatomy. Given these challenges, using the empirical data cleaned from human remains, the mortuary component, site reconstruction and other features of the archaeological context can reveal openings where it is possible to discuss the ways that pathology and trauma limit and challenge the quality of life and hence aspects of the human experience. To not try and make linkages between the corporeal body and the lived experience of individuals and communities limits our ability to say anything of value to policy makers, the general public, and students. Examples of integrating theory, method and data to link indicators of stress on the body with levels of disability, daily or intermittent pain, and diminished capacity to adapt and respond to daily demands are briefly presented as ways forward in the archaeology of human experience.

Martindale, Andrew (University of British Columbia)

- [170] *Quantification of Village Patterns in Tsimshian Territory*

Typologies of complex site forms such as villages are often influenced by judgmental use of hierarchical or selective-paradigmatic sorting to accommodate the wide range of potentially relevant variables. In this paper I present data from the Dundas Islands and Prince Rupert Harbour (n=76 villages) to quantify patterning in a suite of spatial variables derived from structure depressions, shell terrace features, architectural syntax, and topography. These data are used to evaluate proposed village typologies some of which derive from seminal publications and have long traction in Northwest Coast (NWC) archaeology, and some of which Ken and I made up in the pub. I propose that while the most widely recognized forms of village typology have merit, the range of variability in village form is greater than currently recognized. These results have considerable significance for the reigning progressive trajectories widely proposed for NWC settlement history.

- [170] *Chair*

Martindale Johnson, Lucas [62] see Brandt, Steven

Martinez, Desirée (Cogstone & Harvard University)

- [174] *Communicating with a "Good Heart": Strategies for Consultation*

With the increase in federal, state and local projects in recent years, consultation with tribes, as required by cultural resource laws and regulations, occurs more frequently now than ever before. However even with these increased interactions, there still are no coherent consultation definitions and processes; who should be contacted, how it should be done, and how to make successful consultation more likely. This results in confusion and frustration for all parties involved. Drawing upon personal experience and ethnographic research, this presentation will discuss effective strategies Native and non-Native persons working with Native American cultural resources can use during consultation. Using data collected through interviews and meeting observation of two inter-agency and inter-tribal groups based in the Columbia River Basin, it is argued that order to build a

foundation for successful interaction, consultation participants must first remove various communicative, verbal and non-verbal, hindrances before any collaborative work plan can be accomplished. Participants must examine their preconceived notions of the "other side" in order to "set the tone" for effective consultation.

Martinez Taguena, Natalia (The University of Arizona)

- [169] *Comcáac Archaeology: The Ethnography of Collaboration and Historical Data Integration*

In collaboration with members of the Comcáac (Seri) community of the central coast of Sonora, México, an archaeological research project developed that sought to integrate humanistic and scientific forms of inquiry, responsive to Comcáac ontology and oral tradition, to obtain a holistic understanding of the Comcáac past as it is embedded in the landscape, and its relationship with relevant contemporary issues like heritage preservation and land management. This paper describes failures and solutions to integrating ethnographic, archaeological, documentary, and oral historical data throughout the project's collaborative production of knowledge. It employs a reflexive approach to explore the economic, social, political and ecological dimensions that have conditioned the creation of these historical narratives, as well as the present day social processes that promote their recreation. With the overall goal of stimulating discussion on how archaeologists can best innovate methods to bring together the multiple voices of the past and present.

Martínez Yrízar, Diana [234] see Zurita-Noguera, Judith

Martínez-Fuentes, Antonio [254] see Matheson, Carney

martínez-lópez, cira [252] see Winter, Marcus

Martinon-Torres, Marcos [216] see Massa, Giovanni

Martirosyan - Olshansky, Kristine and Boris Gasparyan (Institute of Archaeology and Ethnography of Armenia)

- [208] *Reconnaissance in the Arpa River Valley of Southeastern Armenia*

The Arpa River Basin (Vayoc Dzor Province, Armenia) served as corridor for human movement from at least the Achaemenid period through the Middle Ages. Today, the highways running through the province follow the mountain passes and connect Armenia's northern provinces to those in the south, and the southern province with the Lake Sevan Basin in central Armenia. This paper presents results from a survey conducted in August of 2011. The survey identified 38 sites belonging to the Paleolithic, Neolithic, Bronze Age, Early Iron Age, Antiquity, and Early Medieval periods. Analysis of the settlement pattern of these sites indicates a distinct set of socio-political and economic settlement determinants for each period.

Maruyama, Masashi and Hiroki Kikuchi

- [228] *Domesticating Sacrifice: Changes in Animal Sacrifice in Ancient Japan*

In this paper, I introduce shifting patterns in animal sacrifice from the Jomon period to the Heian period (B.C. 10,000 ~ A.D. 1200) in Japan. The hunting of wild animals was thriving during the Jomon period (B.C. 10,000 ~ B.C. 400). Subsequently, when rice paddy agriculture begins in the Yayoi period (B.C. 400 ~ A.D. 300) incipient pig feeding practices emerged. However, domesticated pigs did not spread rapidly, and it is not until the Kofun period (A.D. 300 ~ A.D. 700) when horses and cattle were introduced from the Korean Peninsula that livestock production flourished. In the Jomon period, deer and wild boar were hunted for sacrifice and food. In subsequent Yayoi period sites in western Japan, it is debated if drilled mandibles of wild boar were utilized as victims of

sacrifice, or as hunting trophies. In the Kofun period, customs of sacrificing horses spread from China via the Korean Peninsula. Ancient texts describe the praying for rain rituals, where horses and cattle are sacrificed. In this way, I evaluate the driving forces involved in shifting sacrificial practices through zooarchaeological and textual evidence. I argue this shift was the result of the introduction of the concept of "sacrifice" that emerged with the spread of domesticated game in Japan.

Marvin, Judith (Foothill Resources, Ltd.) and Rebecca Kellawan (Far Western Anthropological Research Group, Inc.) [270]

With all Dips, Spurs, and Angles

As the old adage goes, "Gold is where you find it." But where do you find it? As part of a federal project, Far Western Anthropological Research Group, Inc. and Foothill Resources, Ltd. conducted an intensive survey of BLM lands in the California foothills in the spring and fall of 2012. The project area largely consists of tributary creeks, rivers, and shorelines, with archaeological resources exemplifying the breadth and diversity of historic mining enterprises characteristic of California's Mother Lode region. All of the identified mining resources were located on, adjacent to, or downstream of the Mother Lode Vein, indicating the importance of pre-field archival research in maps, documents, and mineralogists' reports in the development of a research strategy for survey and recordation within the region. This poster will detail the methods used in preparation of the research design and the results of the survey.

Marwick, Ben [7] see Van Vlack, Hannah

Marwick, Ben (University of Washington)

[150] *An Experimental Study of Trampling at Malakunanja II, Northern Australia: Implications for the Timing of the Human Colonization of Australia*

Previous excavations at Malakunanja II established as a site containing evidence relevant to the timing and character of the first human the human colonization of Australia. Since that time critics have argued that stone artifacts found in the oldest layers of the site were not recovered in their original deposition context, but have been relocated from younger layers by post-depositional processes. In 2012 we conducted new excavations at Malakunanja II. During excavations we conducted an experiment with experimentally-produced replica artifacts placed on the surface of the sediment recovered from the lower layers of the site and walked over in three episodes of five minutes each. The position and orientation of the artifacts were recorded before and after each episode to measure the vertical and horizontal displacement of the artifacts. We investigate the relationship between the Zingg shape classifications of the artifacts and trampling displacement in sediment resembling the original deposit. We find support for claims of artifact relocation and describe the implications for interpreting early deposits at sites in northern Australia.

[7] *Chair*

Masao, Fidelis [11] see Ranhorn, Kathryn

Maschner, Herbert [26] see Misarti, Nicole

Maschner, Herbert (Idaho State University), Jennifer Dunne (Santa Fe Institute) and Spencer Wood (Stanford University) [106]

Food-Webs as Network Tools for Investigating Historic and Prehistoric Roles of Humans as Consumers in Marine Ecosystems

Humans lived on Sanak Island, Alaska, for over 6000 years. This fact motivated us to assemble a food-web describing the trophic

interactions among species in the marine ecosystems of the Sanak Archipelago, integrated over thousands of years, based on a combination of field observation, experimentation, zooarchaeology, and ethnographic data. The food web is constructed of 513 taxa, 6774 feeding links, and an average of 13 links per taxon. We show that the humans are super-generalists, feeding directly on 122 taxa in the marine web. People are also super-generalists, extremely connected to other species, and highly omnivorous. They are #2 in path length and #5 in omnivory, and have short path lengths from all other species (1.76 links on average). 491 of 513 (96%) of species are within 2 links of humans. By feeding on many taxa across all trophic levels, humans have the potential to influence the persistence and stability of marine ecosystems. We present the largest food web ever created with humans as a key component of the total food web and will discuss these results and ways that food-web analyses can inform research on the ecology of humans in marine ecosystems.

[170]

Discussant

Masele, Frank (University of Alberta)

[8] *Middle Stone Age Fauna from Loiyangalani and Magubike, Tanzania*

The open air Middle Stone Age site (MSA) of Loiyangalani is located in the Serengeti National Park in northern Tanzania, while the Magubike rockshelter is in Iringa Region in the south. Both have produced MSA faunal assemblages in association with numerous stone tools. These MSA assemblages were probably produced by anatomically modern humans, well before the Out of Africa 2 dispersals. These faunal assemblages are currently under study for my PhD and will be used in order to determine subsistence practices, dietary choices, as well as other aspects of MSA behavior guided by optimal foraging theory. This will be done through the identification of animal species composition, mortality profiles and bone surface modification.

Mason, Andrew

[192] *Discussant*

Mason, Owen [206] see Darwent, John

Massa, Giovanni (UCL), Marcos Martinon-Torres (UCL) and Mark Aldenderfer (University of California - Merced) [216]

Chemical Compositions and Technological Traditions: A Study of Funerary Metal Artifacts from Samdzong (Upper Mustang, Nepal, ca. 400-600 C.E.)

This paper concerns the study of metallic artifacts recovered from shaft tombs at the site of Samdzong in Upper Mustang, a region of Nepal, dated to c. 400-600 CE. This region includes the Kali Gandaki valley, where a complex population history with multiple migration events is the subject of ongoing investigations.

The collection of objects includes copper vessels, copper beads, brass bracelets, iron daggers, a high tin bronze mirror and a unique gold and silver mask. The archaeometallurgical study sought to contribute to the broader aims of investigating the confluence of material and cultural traditions in the Upper Mustang.

Following a visual assessment of the assemblage in situ and screening analyses by portable pXRF, a selection of samples were examined by metallography and SEM-EDS. The combination of technological and chemical data shows cold-hammering and joining of metal as the dominant tradition, while the presence of iron, cast bronze and brass indicate different craftspeople and most likely, geographic origins. It is hoped that ongoing comparison with metallurgical styles, traditions and techniques in

the broader region will help our understanding of exchange or migration paths around the Himalayan arc.

Masse, W. (Los Alamos National Laboratory), Rubellite

Kawena Johnson and H. David Tuggle

[280] *Relative and Absolute Dating of Hawaiian Myth*

A significant percentage of Hawaiian myths and their detailed storylines are embedded in royal chiefly genealogies, providing a relative chronology for these myths. The stories contain remarkable supernatural elements with varying degrees of associated mana. By applying a natural sciences approach, it is possible to demonstrate that many evocative stories represent the observation of spectacular natural events including volcanic eruptions, total solar eclipses, and the passage of great comets. The myth storylines can be matched with historic records of specific celestial events observed in Asia, the Middle East, and Europe, or in the case of total solar eclipses, with reconstructions using astronomy software. Similarly, genealogically embedded myths about the creation of named lava flows can be matched with radiocarbon dates from burned vegetation under these flows. The data illustrate the richness and general reliability of Hawaiian genealogical oral tradition. The earliest absolutely dated myth is demigod chief Mauiakalana snaring the Sun, which encodes a unique Samoan sunset total solar eclipse in AD 761. The Kanalu genealogy begins with an event that may encode a major Hawaiian tsunami with a calibrated radiocarbon date range of AD 440-670, and if so, raises the possibility of Hawaiian colonization before the 8th century AD.

Massey, Jason (University of Minnesota - Twin Cities), John Soderberg (University of Minnesota -Twin Cities) and Kieran McNulty (University of Minnesota - Twin Cities)

[94]

Approaching Human Figure Petroglyph Variability through Geometric Morphometrics

Jeffers Petroglyphs includes many human figures. They are found across hundreds of meters of the rock surface and in a range of different styles, sizes, and postures. The Jeffers scanning project has acquired three-dimensional models of these figures. This paper analyzes shape differences among these figures using geometric morphometrics. Geometric morphometrics is a comprehensive method for examining differences and similarities in shape. Landmark-based analyses are used here because they are quite effective in quantifying relationships among shapes, allowing for a degree of independent verification for the assessments of shape that form the basis of interpretations. This method has been applied throughout the anthropological sciences to study skeletal ontogeny, human and primate phylogenetics, stone tool standardization, and phytolith assemblages. Here, landmarks consistent among all figures will be collected and a generalized procrustes analysis will take out information pertaining to orientation, position, and size. A principal component analysis will be performed on the shape of the figures to determine if any specific groups can be visualized. If so, these groups will be placed in a discriminant analysis and each figure will be scrutinized using a cross-validation method determining its significance within its defined group.

Massey, David (The Ohio State University)

[149]

Unmanned Aerial Vehicles for Archaeological Surveying

Aerial photography has long been used by archaeologists for the documentation, observation, and surveying of archaeological sites. However often acquiring this imagery can be an expensive and time consuming process. Increasingly, archaeologists have turned to Unmanned Aerial Vehicles (UAVs) to document archaeological sites not only because of their increased availability and affordability but also their speed and reliability. A UAV prototype with GPS triggered vertical photo shooting for orthorectification is built and tested to examine the challenges and implementation issues for other archaeologists.

Massigoge, Agustina [117] see Otárola-Castillo, Erik

Master, Daniel [79] see Alex, Bridget

Mata-Míguez, Jaime [140] see Overholtzer, Lisa

Matheson, Carney (Lakehead University), Felicia Joseph (Departmen of Biology, Lakehead University), Ivan Roksandic (Department of Anthropology, University of Winnipeg), Roberto Rodríguez Suárez (Anthropology Museum, Faculty of Biology, Universit) and Antonio Martínez-Fuentes (Anthropology Museum, Faculty of Biology, Universit)

[254] *A Reevaluation of Genetic Evidence for the Human Migrations into Cuba*

This paper focuses on re-evaluating the ancient and modern genetic evidence for migrations into Cuba. Modern genetic data provides little resolution for the origins of indigenous Cubans. Ancient and modern genetic data from Cuba, the Caribbean, North America, Central America and South America, has been analyzed with consideration for the historical and linguistic context of human migrations into Cuba. The genetic data supports the traditional and most widely accepted migration of humans from South America however it also provides evidence of human migrations from elsewhere, suggesting that human migrations from other location like Florida, the Yucatan Peninsula and Central America as viable locations for the origins of some indigenous Cuban people.

Mathews, Bethany

[128]

Spatial Analysis of the Western Pluvial Lakes Tradition in the Southern Columbia Plateau and Northern Great Basin of North America

The Western Pluvial Lakes Tradition was proposed relatively early in the history of Great Basin archaeological research to account for an apparent early Holocene adaptation to lake environments in the western Great Basin. Basin-specific studies have since established lake-centered foraging patterns across the early Great Basin landscape. Many studies of early Great Basin hunter-gatherers rely on the proximity of relict lake features to known archaeological sites to confirm this early Holocene lake-centered subsistence-settlement pattern. Were Paleoindian subsistence-settlement strategies focused on pluvial lakes, or is a lake-centered pattern produced by the region's archaeological research history? Spatial analyses of cultural resource management survey locations in eastern Oregon reveal that pluvial lakes are overrepresented in regional archaeological surveys, biasing site discovery. Analyses of archaeological site distributions suggest that early subsistence-settlement practices were focused on pluvial lake sub-basins. Sites containing fluted and crescent bifaces are strongly associated with lake margins, while sites containing stemmed bifaces are associated with a variety of landscape features within pluvial lake sub-basins.

Mathews, Darcy (University of Victoria)

[190]

Funerary Ritual, Tradition, and Ancestral Presence: The Late Period Production of Power in the Salish Sea

The Coast Salish peoples of southwestern British Columbia radically changed their mortuary practice around 1500 BP, transitioning from shell midden inhumations to formal cemeteries of above-ground arrangements of stone and soil. These funerary petroforms, previously termed cairns and mounds, were constructed in a variety of patterned shapes and sizes while utilizing different types and proportions of stones and sediment. This remarkable change in funerary practice is exemplified at the Rocky Point mortuary complex on southern Vancouver Island, where 550 funerary petroforms are distributed between two neighboring village sites. Quantitative analyses of feature morphology and a multi-scalar spatial analysis of feature

placement are framed within an ethnographic thematic analysis and body of social theory. The results indicate that this emerging mortuary landscape was not the passive reflection of hierarchy; it was the very process in which power relations were created and negotiated. The Rocky Point cemeteries are the unintended material and spatial consequence of active ritualizing. Funerary ritual at Rocky Point created places of inclusive and exclusive memory, contributed to the ethnographic pattern of familial history as the basis for tangible and intangible privileges and assets, and ultimately resulted in increasing power asymmetries depersonalized and legitimated by the ancestors.

Mathews, Jennifer (Trinity University) and John Gust (University of California, Riverside)

[277] *Hidden History: Daily Life in the Sugar and Rum Industry of the Costa Escondida, Quintana Roo Mexico*

This paper examines our research into the history of the development of the sugar and rum industry in a remote region of northern Quintana Roo known as the "Costa Escondida" from the 1870s to the mid-twentieth century. This project was inspired by Paul Sullivan's 2006 book *Xuxub Must Die: The Lost Histories of a Murder on the Yucatan*, which investigates a mass murder that took place on October 12, 1875 at a remote sugar plantation known as San Antonio Xuxub. Since 2009, we have been conducting archival and archaeological research of Xuxub and several nearby plantations to acquire material evidence of what daily life was like for the people who lived at these sites and worked in the industry. Foreigners often managed these small-scale businesses on small ranches using relatively primitive technology. Despite the remote locations of these sites, we have recovered a surprising number of artifacts imported from the U.S. and other countries, including luxury goods and construction materials. This paper will present an overview of our findings on this poorly understood period, examining in particular the role that coastal trade played in the lives of these isolated populations.

[277] *Chair*

Mathien, Frances and Sharon Hull (Department of Geological Sciences, University of Manitoba)

[252] *Turquoise in the Chaco World*

In the early 1900s George Pepper recovered over 20,000 turquoise artifacts from Pueblo Bonito, the largest site in Chaco Canyon, New Mexico. These artifacts have been the topic of research for many archaeologists because the implications of this discovery are numerous and lead to many models affecting social organization in the southwestern United States. Many of these models are based on large regional scales such as the interpretation of Chaco Canyon as the northernmost node in a long-distance trade network extending into central Mexico, while others are focused on much smaller regions and propose little if any interaction with Mesoamerica. In this presentation we focus on the Chaco World in an attempt to better understand how this society was organized to procure, manufacture, and utilize these beautiful blue-green stones.

Mathieu, James (University of Pennsylvania Museum)

[211] *Exploring Political Landscapes and Complexity One Year at a Time*

The use of geographic information systems (GIS) by archaeologists has resulted in new and interesting interpretations of archaeological remains. However, much of this research is characterized by a limited utilization of the dimension of time. In order to illustrate the potential GIS may have for producing significant diachronic, anthropological, and historical interpretations, this paper will present the results from a time-sensitive GIS study undertaken on an historically well-known dataset. The spatial, temporal, and functional patterning of medieval England's royal buildings during the period A.D. 1066-1650 are analyzed to identify specific historical correlations,

assess causality, and understand the development of the political landscape and complexity.

Mathwich, Nicole (University of Arizona) and Lee M. Panich (Santa Clara University)

[119] *Excavations of a Native American Dormitory at Mission Santa Clara, California*

The 2012 Santa Clara University archaeological field school sampled interior and exterior spaces associated with an adobe structure that housed native peoples at Mission Santa Clara de Asís in Alta California. This structure was in the heart of the mission's neophyte rancheria, which included several adobe barracks as well as native-style dwellings. This project examines the ties that Native Americans living at the mission had to communities outside the mission walls, and considers how native peoples were able to maintain and re-create distinct indigenous identities during the colonial period. This poster details the field methodologies and preliminary findings. We discuss the relationship between pre-excavation GPR survey and features discovered in situ, including American-period trash pits, mission-era stone foundations and roof fall, as well as a large mission-era pit. All mission-period deposits were wet-screened in order to recover micro-artifacts like glass beads, shell beads, flakes, and small animal bones; flotation samples were taken from every mission context. We offer the results of ongoing analyses of archaeological remains such as stone tools, pottery vessels, glass beads, as well as faunal and floral remains. This research augments the growing study of the life of indigenous peoples outside the walls of the mission quadrangle.

Matisoo-Smith, Lisa [47] see Prost, Stefan

Matisoo-Smith, Lisa (University of Auckland), Jose Miguel Ramirez (Universidad de Valparaíso), Michael Knapp (University of Otago), Olga Kardailsky (University of Otago) and Andrea Seelenfreund (Universidad Academia de Humanismo Cristiano)

[47] *Redrawing the Polynesian Triangle?*

In 2007 we published radiocarbon evidence for pre-Columbian chicken bones recovered from an archaeological site on the coast in south central Chile which, combined with ancient DNA data, we argued was evidence for a likely Polynesian introduction (Storey et al 2007). Based on this data, we began looking for further evidence of Polynesian contact with the Americas. While examining collections at the Concepcion Museum in 2009, we discovered human remains from the island of Isla Mocha, located 30km off the coast of Chile, which had numerous characteristics suggestive of Polynesian ancestry. Craniometric analyses of these remains confirmed the association with Pacific Island populations (Matisoo-Smith and Ramirez 2010). We are currently undertaking archaeological and ancient DNA research on Isla Mocha looking for chronologically secure archaeological evidence of Polynesian presence on Isla Mocha. This paper will describe our biological results to date.

Matson, R.G. [69] see Cooper, Catherine

Matson, R. (Univ of British Columbia)

[170] *The Evolution of Northwest Coast Houses and Villages*

The Northwest Coast is well-known for its large villages of big rectangular planked houses, particularly in its central and northern parts. Recent investigations show that this pattern evolved from very small isolated structures which were occupied in the winter. In areas without abundant salmon resources this small house pattern continued into the last 2000 years. Since large planked-house existed by this time, winter villages of large rectangular houses existed in areas adjacent to areas apparently without "villages"

and very much smaller houses. This paper focuses on describing the accumulating evidence of these small houses and their relationship to earlier and later habitations.

Matsumoto, Yuichi

- [19] *Paracas in the Highland? Interregional Interactions between the Peruvian South Coast and South-Central Highlands*
- The emergence of the Paracas culture has been discussed based on the stylistic similarities between the ceramics from the site of Chavín de Huántar and those from the Peruvian south coast during the Early Horizon. Although it has been widely accepted that religious influence from Chavín reached the south coast during the time that the Paracas culture developed, recent advances in the archaeology of the south coast and our excavations at the ceremonial center of Campanayuq Rumi in the south-central highlands enabled a reconsideration of the formation of Paracas culture and its unique ceramic style. These new data reveal the complex nature of inter-regional interactions among the south coast, south-central highlands, and Chavín de Huántar during the Initial Period and Early Horizon. Although it seems certain that the influence of Chavín reached these regions at the beginning of the Early Horizon, the emergence of Paracas culture/style was not a unidirectional process and it is necessary to reconsider this issue based on regional perspectives that changed throughout the Initial Period and Early Horizon. Stylistic comparisons of regional ceramic assemblages on the south coast and south-central highlands make it possible to describe this process of interaction as historical entanglements of regional agencies.

Matsumoto, Go (Dumbarton Oaks Research Library and Collection)

- [136] *Eating and Drinking with the Dead: Commensal Hospitality for Integrating People in the Multiethnic Society during the Middle Sicán Period (ca. 900-1100 C.E.)*
- The archaeological site of Sicán in the mid-La Leche Valley on the Peruvian North Coast was the center of a state-level society that emerged after the political demise of the preceding Mochica (ca. 750-800 C.E.) and reached its height of prosperity during the Middle Sicán Period (ca. 900-1100 C.E.). The society is currently thought to have been a multiethnic state that consisted of at least two (or perhaps four) culturally distinct groups of people. Recent excavations within the Great Plaza at the focal point of the site, surrounded by major platform mounds and burials, revealed a series of material traces of multiple activities that probably took place side by side (e.g., making and repairing funerary bundles, chicha pouring into a ritual canal, and large-scale food preparations and consumptions) and got involved many people different in social status and/or cultural identity. Focusing on food practices among others, this paper will discuss the integrative role of food consumptions and closely associated ancestor veneration practices within the plaza. I will argue that those practices helped to mitigate an inherent tendency toward factionalism or sociopolitical tensions within the society with a complex ethnic and social composition and inequality under the name of ancestor veneration.

Mattes, Matt and Anna Antoniou (University of Michigan)

- [205] *Region Perspectives on Prehistoric Wealth, Demography, and Village Life in the Middle Fraser Canyon, British Columbia*

Research into the lifeways of pithouse-dwelling First Nations groups in the Middle Fraser Canyon of the British Columbian Plateau has been informed by extensive anthropological studies and documentation, ranging from James Teit's 19th century ethnographies to decades of archaeological investigations. The opportunities to study social inequality, environmental interaction, and village formation at the levels of the household, the village, and the region are seemingly innumerable and enabled by these records, as well as by actively engaged First Nations groups,

generally well preserved and discrete archaeological contexts, and ample radiometric dating. These data have illustrated pictures of extended kin groups living in multi-family pithouse residences, thriving on riverine and terrestrial resources, organized under the tenets of complex socio-political systems. Of particular importance now, after these decades of study, is the investigation of socioeconomic and political patterns within these systems on a regional level, as they are well documented elsewhere in the Fraser Canyon but remain hypothetical in the Middle Fraser. A meta-analysis of past archaeological reports was designed to address this research question, and among several data sets, the measures of material wealth disparities relative to population changes over time augments current knowledge and theory about large village formation.

Matthews, Christopher (Montclair State University)

- [100] *Discussant*

Mauldin, Raymond (UT San Antonio), Robert Hard (UT San Antonio), Cynthia Munoz (UT San Antonio) and Jennifer Rice (Our Lady of the Lake University)

- [41] *Stable Carbon ($\delta^{13}\text{C}$ collagen, $\delta^{13}\text{C}$ carbonate) and Nitrogen ($\delta^{15}\text{N}$) Isotopes from Radiocarbon Dated Hunter-Gatherer Remains at Hitzfelder Cave, Texas*

The prehistory of much of Texas reflects a long sequence of hunter-gatherer adaptations. While agriculture was practiced to the north, south, east, and west, it was not present in Central Texas until historic contact. This prehistoric sequence provides researchers with an opportunity to investigate processes of hunter-gatherer stability as well as intensification on non-agricultural resources. One method that, until recently, has been under-used in those investigations is a focus on human isotopic data. Here we present stable isotope results for directly dated ulnas that reflect different individuals from Hitzfelder Cave, a vertical shaft site excavated in the 1960s in Central Texas. The isotopic shifts over time identified in our analysis provide a detailed look at diet, with specimens from 19 individuals dating from about 4475 BP, the close of the Middle Archaic, to 1660 BP, near the end of the Late Archaic, and a 20th specimen dating to 470 BP (Late Prehistoric). Focusing on the Middle and Late Archaic materials, the stable carbon and nitrogen isotopic patterns at Hitzfelder are distinct from those shown previously in the region for this period, suggesting that substantial subsistence diversity, and possible multiple adaptive trajectories, characterized the Central Texas Archaic.

Mauldin, Raymond [281] see Munoz, Cynthia

Maxwell, Robert (University of Sydney)

- [49] *Concrete Ideals: Dissonance and the New Brutalism*

A theory of difference recognises that the material and the social can become disengaged over time. Dissonance, or socio-material friction, can occur due to changes in ideology, sociality, or ascribed function, often leading to the failure of a site or settlement. The architecture of The New Brutalism is a key diagnostic indicator of dissonance in the archaeological 20th century. Much loathed and consequently highly endangered, its emergence describes a material response to key ideological pressures of the Cold War period. Now, through its fabric and inertia in the landscape, we are challenged. It is a new century. Do we retain the problematic materials of yesterday, or do we remove them? Difference theory offers a new way of looking at this issue and offers an expanded conception of 'value' in archaeology.

Maxwell, David (Simon Fraser University) and Jonathan Driver (Simon Fraser University)

- [116] *New Approaches to Old Data: Plains Bison Kill Population Dynamics Revisited*

Catastrophic and attritional mortality profiles found their first major use in archaeology in the interpretation of Plains bison kill sites. More recently, Mary Stiner and others have advocated the use of triangular graphs comparing frequencies of young, prime-age, and old animals. In this paper, we provide comparisons of triangular graphs with traditional x-y graphs of bison population structures from several sites on the Great Plains, ranging from Paleoindian to Late Prehistoric in age. Preliminary analysis suggests that most of these best fit the expectation of mass kill events occurring after a year or more of attritional mortality. We also offer a comparison with a modern analog to prehistoric Plains bison herds: the African wildebeest. We present wildebeest population and mortality data in the same fashion as bison data, allowing for a comparison between these large, mobile, herd animals.

Maxwell, Timothy D. [252] see Hull, Sharon

May, Sally and Paul Taçon (Griffith University)

[163] *Taken for Granted? Comparing the Depiction of Southeast Asian and European Watercraft in the Rock Art of Northern Australia*

Far from the generally accepted notion of an isolated shoreline, the north Australian coast was teeming with watercraft and their crew engaged in trade for hundreds of years before European exploration and settlement. Most commonly referred to as 'Macassans', these early traders came to harvest trepang and for materials such as turtle shell and iron wood. Across the north of Australia, Aboriginal groups used rock art to document these interactions—depicting the watercraft, crew and associated material culture. Likewise, with later (and, for a while, contemporary) European exploration and settlement, artists continued to use rock art to document and interpret their changing lives and experiences. During our 5 year (and ongoing) study of contact rock art in Australia, we found that ships dominate rock art made during the last 500 years. Yet, our western and northwestern Arnhem Land case study areas produced some further perplexing results. For example, despite the longer period of interaction with 'Macassans', it is the later English watercraft that significantly outnumber any other rock art subject-matter. In this paper, we place our exploration of the historical and localized impacts of these coastal interactions within wider theoretical understandings of rock art and social or maritime identity.

May Ciau , Rossana [171] see Bey, George

Mayburd, Miriam (University of Iceland)

[55] *Landscapes of Death and Otherness: Icelandic Terrain and Medieval Attitudes about the Dead*

This paper investigates the unique features of Icelandic geographical terrain and its impact upon the cognitive reality of medieval Iceland, departing from conventional literary interpretations of Icelandic sagas that tend to reduce landscape's role in the narratives to a set of stylistic motifs self-consciously inserted by authors within their creative fiction. Focusing on Iceland's western coast, I examine sagas' depictions of Viking-Age individuals passing into their local mountains when they die (a belief unique to that area), arguing that this does not constitute death in the conventional sense of ceasing to be, but a transformation into ambiguous "other" entities that continue to inhabit the landscape in an altered state. The textual analysis will be brought in dialogue with archaeological data concerning placements of mounds and burial sites in the same region and time frame, aiming to illuminate the role of the landscape as a stage shaping medieval Icelandic beliefs and attitudes regarding their dead. Instead of dichotomous opposition between this-world and other-world, I propose that the Icelandic landscape was perceived as both at the same time, not as a bridge from one to the other but as a very tangible space where such boundaries are confused and do not apply.

Mazzucato, Camilla

[9] *GIS Practice at Çatalhöyük: From Excavation to Digital Representation*

Since 2009, close collaboration between the newly created Geographic Information System (GIS) team and various members of the Çatalhöyük Research Project has led to the creation of the Çatalhöyük GIS geodatabase. The Çatalhöyük Research Project GIS is now routinely used for spatial data analysis, map making, excavation and survey data management and storage. The broad range of data collected and stored (excavation, survey data, modern and historical maps, aerial photographs, computer vision data, geophysical data and environmental data) makes it - together with the site database to which it is dynamically linked - the main storage and analytical tool of the project. Since 2012 the Çatalhöyük GIS team has been working on the integration of 3D computer vision models created during the excavation season. The close collaboration between archaeologists and specialists involved in the implementation of computer vision techniques on site provided the opportunity to further develop the Çatalhöyük GIS as the main tool for storing, visualization and analysis of site data.

Mazzucato, Camilla [32] see Tung, Burcu

McAlister, Andrew [62] see Sheppard, Peter

McAllister, Martin [135] see Griffel, David

McAllister, Martin (ADIA), David Griffel (ADIA), James Moriarty (ADIA) and Larry Murphy (ADIA)

[135] *Archaeological Crime Scene Investigation: Training the Investigative Team*

Archaeological crime scene investigation is mentioned in at least one general college textbook on criminal investigation, but is not part of any regular college curricula on the forensic sciences or archaeology. However, due to over 100 years of combined expertise in this area, the staff of the firm of Archaeological Damage Investigation & Assessment (ADIA) has taught classes on archaeological crime scene investigation to almost 8,000 government and tribal law enforcement officers and archaeologists. Several federal prosecutors have also attended these classes. ADIA currently has four standard classes dealing with the various aspects of this topic, including violations involving submerged resources. The importance of this educational effort in protecting heritage resources is demonstrated by the fact that a number of the graduates of these classes have been involved in cases that have resulted in successful detection, investigation, and prosecution of violators.

McAnany, Patricia (University of North Carolina, Chapel Hill) and Maxime Lamoureux St-Hilaire (Tulane University)

[65] *Detaching from Place in Theory*

A process replete with recursivity, complexity, and equifinality, detachment from place remains an under-theorized topic that, nonetheless, is central to the hermeneutics of archaeology. Mobility is deeply rooted within human DNA and often cited as a factor in the success of our species; but among peoples characterized as "sedentary", detaching from place is more often characterized as societal failure. Adopting an agent-focused approach to detachment from place, we examine cycles of habitation, detachment, re-attachment elsewhere, changing perception/use of earlier places of habitation and, finally, the archaeological hermeneutics of this process. Two triggers are thought to stimulate detachment from place: stressors and enablers. Next, the process is negotiated with family and community. Whether abandonment is total or partial, agents

negotiate change in reference to the prevailing stressors and enablers. A prime concern of abandoners is establishment at a different locale, which initiates a new cycle of community. Abandoners alter their perception of a previously inhabited landscape in reference to the motivation for abandonment as well as the frequency of re-visitation. Popularly known detachments from place are discussed to facilitate deeper archaeological engagement with the hermeneutics of this process.

[165] *Chair*

McAnany, Patricia [165] see Rowe, Sarah

Mcardle, Angela

[126] *An Iconographic Approach to Lithic Analysis in Mesoamerica*

This paper examines depictions of flaked stone and ground stone in the contexts of Mesoamerican iconographic and epigraphic representations, particularly concerning the cross-cultural use of flint symbology. Although it is difficult to observe the detailed morphology of stone in most depictions, and thus problematic in distinguishing typologies and constructing technological sequences, it is possible to discern the significance altered stone held in Mesoamerican cultures in both function and symbolic meaning. It is possible to ascertain this significance based upon the spatial placement of stone in artwork and text, its prevalence in certain scenes and absence from others, its association with specific actions and personages, and its symbolic transference of intrinsic attributes that imbue associated non-stone entities with meaning. Analyzing the way in which Mesoamerican peoples utilized images and textual references of stones in their painting, writing, and sculpture can provide a clarifying framework in which to approach the functional analysis of the tangible lithic artifacts archaeologists encounter.

McBeth, Sally (University of Northern Colorado)

[75] *The Return of the Native: Northern Ute Removal From and Return to Colorado Ancestral Homelands*

Through the lens of an applied cultural anthropologist, this presentation will examine Ute perspectives on connections to landscape and place. Based on historic accounts and recent fieldwork with the Ute, I will investigate Ute loss of ancestral homelands in western Colorado. In 1881 the Northern Ute bands lost possession of their Colorado Territory homelands—a vast territory of over one-third of Colorado. The situation for the Utes in the 1850s and beyond was somewhat unique in the American West—the peaceful and prosperous Utes had rights to a vast territory of over one-third of Colorado—roughly 16-20 million acres. Ute rights were established by the 1868 treaty (sometimes called the Kit Carson Treaty) which has been called “the most favorable Indian treaty in the history of the country.” It was negotiated by multilingual statesman Ouray, named by the federal government in 1868 as spokesman for all Colorado Utes. Historic accounts from western newspapers (1882-1912) will be combined with emotional reflections collected during twenty-first century return visits to their Colorado ancestral homelands. Northern Ute tribal members discussed the cultural significance of removal, connection to place, and rationale for their ignominious displacement from Colorado to Utah.

McCafferty, Geoffrey (University of Calgary) and Sharisse McCafferty (University of Calgary)

[136] *Sacasa Striated Shoe-Pots of Pacific Nicaragua: Function and Meaning*

Sacasa Striated urns are among the most distinctive artifacts from the Postclassic period in Pacific Nicaragua (AD 800-1520). They tend to be ovoid in shape with the orifice at the top of one end, and they often feature decorative appliques on the upper section of the opposite end. This unique shape has often been described as

“shoe-shaped,” and “shoe-pots” have been recovered archaeologically from numerous sites in Pacific Nicaragua, particularly as mortuary urns. This essay will consider the temporal and spatial distribution of Sacasa Striated shoe-pots as they may have functioned as cooking vessels as well as burial urns, and how their archaeological contexts and decorative elements provide evidence of their symbolic meaning for pre-Columbian Nicaraguans. Specifically, we consider decorative elements applied on the exterior of the ‘toe,’ burial contexts, and general morphology to argue that these were effigy cacao pods, and that cacao was an essential regenerative symbol associated with female gender and the life/death cycle.

[210] *Discussant*

McCafferty, Sharisse [136] see McCafferty, Geoffrey

McCafferty, Sharisse (University of Calgary) and Geoffrey McCafferty (University of Calgary)

[287] *Communities of Practice? Garden Cities of Pacific Nicaragua*

Pacific Nicaragua featured a remarkably high population density upon first-contact with Europeans in 1522. “Urban” centers were dispersed, however, and have become known as ‘garden cities’ because residential clusters were generally surrounded by fields and orchards. Intensive excavations at several Early Postclassic/Sapoa period centers since 2000 provide a glimpse of life and social organization in these garden cities. Santa Isabel on the shore of Lake Cocibolca featured a dense cluster of residential mounds, and offers a rich cross-section of domestic material culture. Tepetate, located about 50 km up the lakeshore, was a regional center with possible civic-ceremonial architecture that adds a socio-political dimension to community organization. Nearby El Rayo also provided insights on commoner domestic practice, but was most notable for the variation in mortuary practice found in two discrete cemeteries. Contemporary in time, relatively close spatially, and all provisioned by lacustrine resources, these three sites offer varying insights on ancient Chorotega culture, raising the question of the degree to which time/space/environment participate in the production of cultural similarities, and the significance of variation. This paper will consider both the commonalities and dissimilarities that have been encountered to argue for the consideration of the ‘cultural mosaics’ of ancient agencies.

McCall, Grant [11] see Enloe, James

McCarthy, Elizabeth (Univeristy of Missouri), Richard Kennedy (University of Missouri), Jason Christy (University of Missouri) and Alisa Walton (University of Missouri)

[147] *Stones and Bones: A Revisit of the Differentiation of Chert and Obsidian Made Cut Marks*

Previous research has shown that cut marks made with a range of materials, such as stone and metal, can exhibit different morphological characteristics. This presentation is a continuation of a study attempting to differentiate lithic materials. In an experimental setting, cow long bone shafts were cut using both obsidian and chert flakes with a consistent angle and pressure. Ten morphological characteristics were analyzed for each mark and given a point if the characteristic was “obsidian-like”. The data suggested that obsidian and chert could be differentiated based on the total scores of the cut marks on an assemblage level. Current research consists of two supporting studies. The first had two individuals, one with experience and the other a novice at taphonomic analysis, look at the original set of cut marks and score them. These scores were then compared to the original data set and suggest that with some training, the marks could be differentiated using this method. In the second study, another researcher was also able to differentiate between the chert and obsidian made marks by replicating the original experiment.

McClelland, John (Arizona State Museum)

- [286] *Integrating Biostatistics and Mortuary Behavior: A Search for Patterns at PPNB Beidha, Southern Jordan*

The Pre-Pottery Neolithic site of Beidha in southern Jordan is unusual among Levantine sites for its sequence of evolving architectural forms, most likely reflecting parallel changes in social structure. Mortuary patterns evolved in tandem. The earliest phase held an intramural interment of mixed age individuals, possibly a family group. The final occupation phase was characterized by clustered intramural interments of infants, frequently in association with a single adult. Does this grouping of young juvenile burials indicate reduced emphasis on family ties in the mortuary program? In this study, I examine non-metric and metric phenotypic variation in deciduous teeth to test the hypothesis that the spatial distribution of juvenile burials was independent of kinship. Preliminary results do not support the hypothesis, suggesting that juvenile burial clusters are reflective of biological kinship. At Beidha, juvenile burial clusters seem to associate houses with extended family units or lineages. This contrasts with recent work at the contemporaneous Neolithic site of Çatalhöyük in Anatolia (Pilloud and Larsen 2011), where there was minimal evidence for biological affinity related to interment location.

McClure, Sarah B. [68] see Zavodny, Emily

McConaughy, Mark (PA Historical and Museum Commission)

- [6] *Reassessing Peter's Creek and Linn Mounds, Pennsylvania*

Peter's Creek and Linn (36WH36) Mounds are located in Washington County, Pennsylvania. Dragoo (1955, 1963) believed both mounds were related to Cresap phase Adena groups based on artifacts recovered from in or near the mounds. A recent reexamination of the artifacts by the author and radiocarbon dating of various mound types from western Pennsylvania suggest Peter's Creek and Linn Mounds should be placed in the Fairchance phase of the Middle Woodland.

McCorriston, Joy (The Ohio State University)

- [195] *Historical Metaphors and Mythical Realities in Bronze Age World Systems*

World Systems Theory assumes a technologically advanced core dominates periphery cultures. This is unsubstantiated either in terms of political economies or in the archaeological records of Old World prehistory. Critics have called for models that better describe peer relations and social contexts of long-distance economic exchanges. But World Systems Theory continues to describe large-scale, long-term economic cycles that frame cultural interactions over a large part of the Old World and hence remains an important heuristic device in world history and prehistory. This paper draws upon the well-documented contacts between Europeans and Hawaiians in the famous study of Captain Cook's death at Kealakekua Bay in 1779. Adeptly theorized by anthropologist Marshall Sahlins, whose analysis of the apotheosis of Captain Cook has broad implications, the incident provides important guidelines for understanding cultural exchanges elsewhere. In the ancient Near East, where trading ships from Mesopotamia and the Indus Valley landed on the shores of the Arabian Peninsula more than five thousand years ago, the historical metaphors and mythical realities of structural history provide important clues to the social contexts of an archaeological record of sustained cultural interaction.

- [195] *Chair*

McCoy, Mark [5] see Messersmith, Mallory

McCoy, Mark (University of Otago)

- [255] *The Significance of Religious Ritual in Ancient Hawai'i*

A session in honor of Patrick Kirch's intellectual contribution to the archaeology of Hawai'i would be incomplete without a discussion of his wide-ranging scholarship on traditional Hawaiian religion. In this paper, I focus on three themes that can be tracked from his early career through to the present. The first is the incorporation of the study of heiau (temples), shrines, and other sacred sites described in ethnohistory within the historical context of the development of Hawaiian society, most recently represented in his book entitled How Chiefs Became Kings. The second is his contribution to the interpretation of heiau architecture and ritual practices through close attention to architectural details such as orientation, elaboration, and offerings. These works have helped draw us closer to understanding how Hawaiian architects wove elements of the natural and spiritual worlds together to mark places as sacred. The final theme is his commitment to the care, preservation, and protection of sacred places through raising public awareness. In the books, Feathered Gods and Fishhooks, Legacy of the Landscape, and A Shark Going Inland is My Chief, he has brought to a broad audience a message of respect for all of Hawaii's archaeological sites, but especially religious sites.

- [255] *Chair*

McCray, Brian (Vanderbilt University) and John Janusek (Vanderbilt University)

- [50] *Fringe Benefits? Analysis of Microterracing in the Icla Valley, Eastern Bolivia*

The study of productive systems is an important component of arguments evaluating sociopolitical structure and ethnogenesis. This study analyzes canal and terracing systems in the Icla Valley, along the eastern slopes of the Bolivian Andes, toward evaluating the sociopolitical structure of the resident population. Extensive sections of the Icla Valley, along Cerro Salli Salli, contain remnants of unique agricultural systems characterized by canals and narrow terraces less than 1 m in width. Similar terraces (without canals) are present above the nearby site of Chullpamoko-Kochipata. Test pits reveal rich soil directly under gravelly eroded soil currently only supporting xerophytic vegetation. These terraces reflect significant investment, but initial survey could not determine clear associations between the Salli Salli terraces and specific settlements or settlement clusters. The Chullpamoko-Kochipata terraces, conversely, have an obvious site association. Creative approaches to agriculture along the eastern slopes led to the apparently unique productive systems of the Icla Valley. GIS analysis will compare the two regions, and trace associations between hydrological catchment areas, terrace and canal systems, and the pathways connecting the productive systems and contemporary sites. This study analyzes possible sociopolitical implications of this unique agricultural strategy in a context of interregional interaction.

McCray, John [85] see Lail, Warren

McCutcheon, Patrick [70] see Rennaker, Patrick

McDonald, Jo [163] see Veth, Peter

McDonald, Josephine (University of Western Australia)

- [163] *Oh! I Do Like to Be beside the Seaside... Reflections on Landscape Use in the Coastal Zone of the Sydney Region*

The rock art of the Sydney Basin is located between the coast and the Blue Mountains, in south-eastern Australia. Stylistically the art of this region reflects a coherent social bloc. Stylistic variability here is attributable to five defined language areas and to the social

context of the art's production. This paper looks at the rock art within a single language area (Guringai) and explores how a coastally oriented group with a strong maritime economy has mapped onto the land. Subject choices in the art – and archaeological evidence from rockshelter and midden sites – generally reflect the coastal economy. But the art is more than a menu of the important resources of the Hawkesbury River - at this fertile coastal and estuarine interface. The rock art demonstrates that people are using various landscapes across their territory to signal different types of attachments to the land and different messages about their natural and social realms.

[163] Chair

McEwan, Colin (Dumbarton Oaks)

[60] Discussant

McFadden, Lara (University of Toronto)

[39] *Feasting the Dead: The Significance of a Faunal Assemblage at an Ancient Burial Ground*

Recent excavations at an ancient burial ground, DjRw-14 on the south coast of British Columbia, dated 4000-3500 cal. BP, have yielded an unusual faunal assemblage with a high frequency of deer remains and relatively low frequencies of marine fauna. With little or no evidence of habitation at the site during the period in question, it appears likely that the high proportion of deer is related to mortuary ritual that involved consumption of deer meat.

Through analysis of the deer remains, I will examine the ways in which deer were transported, processed, and consumed on site. This assemblage provides a rare opportunity to investigate feasting behavior associated with mortuary ritual.

McFarlane, William (Johnson Co. Community College, KS) and Miranda Suri (Queens College, CUNY)

[264] *Investigating Community Dynamics: Recent Research from the Jesus de Otoro Valley, Honduras*

Three seasons of work in the Jesus de Otoro valley of central Honduras have begun to illuminate the lives of this little-known region's Pre-Columbian occupants. We address several distinctive factors of life in this mountain valley, including the apparent presence of multiple contemporaneous tier-1 settlements in a geographically constrained region, the role of the nearby La Esperanza obsidian source in the local and long distance economy, and the interplay between public and residential life at the center of Sinsimbla. We also comment on cultural similarities and differences to other potential Lenca settlements within northwestern Honduras, particularly with reference to building practices and pottery production and exchange. In sum, the work of the Proyecto Arqueologico Valle de Jesus de Otoro reveals the potential for small-scale and minimally intrusive research strategies to address complex issues at various scales of analysis.

McGlynn, George [79] see Olsen, Karyn

McGovern, Jeffrey [111] see Rockman, Marcy

McGuire, Kelly (Far Western Anthropological)

[12] *Incised Stones and Social Identity: A Case Study in the Rise of Complex Social Formations in Northern California during the Archaic Period*

One of the largest portable rock art assemblages ever documented in North America was recovered from a series of archaeological sites within and near the Sacramento River Canyon in Northern California. Obtained from components dated from

5,000 to 3,000 years ago, the homogeneity of stylistic attributes associated with these incised stones suggests that they were produced by a singular, highly developed socio-cultural entity. The symbolic potential of these artifacts with respect to internal affiliation, and their role as an unambiguous signal of group identity to outsiders, marks the rise of complex societies in this region.

McGuire, Randall (Binghamton University) and Elisa Villalpando (Centro INAH Sonora)

[97] *Cerros de Trincheras and Defense in the Formative Period Trincheras Tradition*

Visions of peaceful people confronted by a harsh environment have long dominated archaeological studies of the prehistoric Southwest. Some archaeologists argue instead that warfare drove cultural developments in the region. In Sonora, México prehistoric peoples constructed terraces on isolated volcanic hills, and built rooms, compounds, and other edifices on their summits to create cerros de trincheras. Advocates of a violent prehistory for the Southwest interpret these sites as forts and as evidence for warfare. In the spring of 2006, the Cerros de Trincheras and Defense Project conducted eight weeks of fieldwork mapping and surface collecting cerros de trincheras in the Río Altar and Río Magdalena. The project used Geographic Information Systems analysis to answer a series of questions: Is there evidence for defense at these sites? If so, how were these sites defensive? What was the range of activities on these sites? What was protected? How did defense relate to other activities on the sites? And, how did these relations change over time? The project demonstrated that the defensive character of Formative Period cerros de trincheras in the Trincheras Tradition changed over time and that defense does not adequately capture the complex activity structure of most of these sites.

McIntosh, Roderick

[164] *A Success too Sweet: Who Sheds Tears when Looting Ends*

After a horrific rise in looting at archaeological sites near Jenne-jeno (Mali, West Africa) (looting to feed the illicit international traffic in terracotta statuettes) that began in the late 1970s, looting essentially came to a complete halt by roughly 1995. That success was due to a concentrated effort of local public education and site monitoring (by the Ministry of Culture's Jenne Mission Culturelle), to the government's efforts to interdict objects leaving the country (orchestrated by the National Museum and by the principal heritage protection agency, the Direction National des Arts et de la Culture (DNAC)), as well as due to the effects of the Mali-US bi-lateral protection accord (initiated in 1993). Since 1995, periodic survey circuits of the several hundred archaeological sites within a roughly 40 km radius of Jenne show negligible evidence of renewed looting. This would seem to be cause for celebration. Yet in sworn testimony before the State Department's Cultural Property Advisory Committee in 2012, art/antiquities dealers and museum directors argued that the Mali-US Bi-lateral accord had failed. What is at the root of this massive "cognitive dissonance"?

McKechnie, Iain [71] see Rodrigues, Antonia

McKenzie, Hugh and Alexander Popov (Far Eastern National University (FENU), Vladivostok)

[194] *Cranial Modification from the Boisman II Hunter-Gatherer Cemetery (ca. 5300-6000 B.P.), Russian Far East*

Cranial modification is a widely distributed cultural practice in both time and space, being found on every inhabited continent and in a variety of historic and prehistoric cultural contexts. As a permanent bodily modification that is applied to infants, ACM is one important method of symbolizing ascribed social identities and so can be useful for bioarchaeological investigations into inter and intra-group social relations. Previous research (Chiikisheva 2003) at the Boisman II hunter-gatherer cemetery (~5300-6000 BP) located on

the Russian coast of the Sea of Japan has described a variety of forms of deformation in 11 of 17 observable crania, which represents among the earliest – if not the earliest – examples of the practice in Asia. The aim of the present study is to reevaluate this evidence.

McKenzie, Dustin K. [204] see Joslin, Terry

McKenzie, Chantal (Texas Military Forces)

[281] *Military Construction and Archaeology: Exercises in Cooperative Planning*
Construction project managers on historic building rehabilitations often do not consider the potential impacts of construction to buried cultural resources, particularly when they are working within the footprints of existing features and assumed "previously disturbed" areas. However, failure to sufficiently plan for such discoveries often negatively impacts project schedules, scopes, and costs. Cooperative and tactical planning between cultural resources staff and construction project managers is crucial for avoiding pitfalls. Working together, personnel can develop standards for investigation, protocol, and oversight early in the planning phases of historic rehabilitation projects. By examining Texas Army National Guard construction projects that have encountered unknown buried cultural resources, this paper offers insights into effective strategies for ensuring successful construction project outcomes.

McKinnon, Jennifer (Flinders University)

[73] *Community Archaeology Approaches in the Commonwealth of the Northern Mariana Islands (CNMI)*
In 2007 as part of a reconnaissance trip to the Mariana Islands to assess the potential for Spanish colonial archaeology research, the author was struck by the incredibly diverse heritage of the island (Chamorro, Carolinian, Spanish, US, Japanese, German, Korean and Filipino) and a local interest in researching, understanding and protecting the past. Driven by community interest and agency support several projects have eventuated including the recording of WWII US and Japanese underwater heritage sites, the development of a maritime heritage trail and 3D interpretive film, the recording of the Indigenous maritime cultural landscapes and seascapes, a feasibility study of Spanish colonial archaeology research and a community-based study for protecting cave shelter sites on private property. Several of these projects were perceived and guided by community members. Further, these projects included community participation and collaboration and trainings to both build capacity on island and raise awareness of protecting heritage. This paper will outline the community archaeology aspects of this research, discussing some of the challenges and successes of working with and for a community.

McLaren, Duncan (University of Victoria and Hakai Institute)

[206] *Uncovering Long-Term Archaeological Sequences and Landscapes on the Central Northwest Coast*
The Hakai Ancient Landscapes Archaeology Project is being undertaken on the central coast of British Columbia. The primary goal of the project is to find and investigate archaeological sites with long archaeological sequences. The study area is hypothesized as being unique on the Northwest Coast as sea level has been fairly stable over the last 11,400 calendar years. For this reason, shell middens and other site types have evidence of repeated human habitation spanning the Holocene period. In some instances the long-term accumulation of stratified anthropogenic deposits has resulted in landforms over five metres high. Site testing has been conducted using probes, augers, and excavation units. Combined with radiocarbon dating, the collection and analysis of lithic, bone, and water-logged materials from these sites allows comparisons with other diachronic

sequences including those developed from palaeo-environmental and oral historical sources. An additional project goal is to search for late Pleistocene archaeological deposits. To enable this, a relative sea curve is being constructed using isolation basin coring and diatom analysis. The resulting curve, combined with LiDAR data, will help pinpoint the locations and elevations of raised relict shorelines that resulted from late Pleistocene glacial isostatic depression, providing targets for future field investigations.

McManamon, Francis [10] see Kintigh, Keith

McManamon, Francis (Center for Digital Antiquity)

[72] *Goals of a Passing Generation: Saving and Sharing Archaeologists' Legacies*
The 1960s and 1970s were full of ferment and new ideas in archaeology. The New Archaeologists were challenging Cultural Historians; CRM was developing as a shift from the "salvage archaeology" approach. The "new archaeologists" and early CRMers are now facing the ends of their careers. Some have taken steps to ensure the long-term access and preservation of the results of their work. Others are only now considering the legacy of their careers. This presentation will examine how aging affects the perspective of practicing archaeologists regarding the data and interpretations that they produce during their careers. One aspect of this examination will focus on how or whether individuals benefit from knowing that their professional work contributes to a larger legacy of advancing knowledge. The presentation also will describe the Digital Archaeological Record (tDAR), an archaeological digital repository that archaeologists use to save and share their professional legacies.

McManus, Ellen (University of Aberdeen), Kate Britton (University of Aberdeen; Max Plank Institute for Evolutionary Anthropology), Keith Dobney (University of Aberdeen) and Rick Knecht (University of Aberdeen; University of Alaska Fairbanks)

[20] *A Stable Isotope Investigation of Human-Dog Relationships at a Permafrost-Preserved Site in Prehistoric Western Alaska*

Dogs have frequently been used as analogues for past human diet in situations where human remains have not been found, or where their investigation by techniques such as stable isotope analysis is not possible. In regions such as the Arctic, where dogs have played a critical role in human transport and hunting activities, the close, interdependent relationship between humans and dogs makes them an even more valuable source of information on past human behavior and subsistence. The Western Thule village site of Nunalleq (Yup'ik for 'the old village'), in the Yukon-Kuskokwim Delta region of Western Alaska, is the focus of a major project currently being carried out by the University of Aberdeen, in partnership with the local Yup'ik village corporation. Permafrost conditions at the site have resulted in incredible preservation of organic material and faunal remains in house floor deposits, including canid fur, bones and teeth. Human hair has also been recovered from these non-mortuary contexts. This paper will explore the relationship between humans and dogs at Nunalleq through stable isotope analysis, and will address how people and their animals lived in and adapted to this region of extreme climatic variation and fluctuating resource availability.

McManus, Ellen [138] see Britton, Kate

McMillan, Alan [71] see Arndt, Ursula

McNabb, Caitlyn [236] see McNabb, Caitlyn

McNabb, Caitlyn (Washington State University) and Caitlyn McNabb (Washington State University-Pullman)

[236] *Water Management and Settlement Patterns in the Lower Nepeña Valley*

Recent investigations on the nature and implications of large-scale irrigation have centered around the Moche State. Irrigation propelled the complexity and extent of the Moche sphere, as irrigation-based subsistence strategies were employed long before the complexity of the state. This study examines early urbanism as a precursor to the state by modeling potential spatial, social, and political dynamics of early irrigation systems in the Nepeña Valley, a region argued to be a social and political periphery. By doing so, I dispel the myth that certain settlement pattern shifts were a result of warfare. In order to examine shifts in subsistence and settlement, potential canal trajectories are estimated for each time period based on site location as well as degrees of social complexity and political authority as indicated by architectural analysis. Ultimately, it becomes apparent that politically organized forms of irrigation strategies were present as early as the Late Preceramic Period. Evidence suggests gradual, in-situ, intensification of irrigation systems along the river plain until the transition to large urban centers, which reflects a transition to a subsistence strategy coupled with a socially complex political structure. These results shed doubt on warfare based narratives for the region that rely on punctuated change.

McNamee, Calla (University of Calgary), Christopher R. Moore (Savannah River Archaeological Research Program, So), Mark J. Brooks (Institute of Archaeology and Anthropology, University of South Carolina), Andrew H. Ivester (Department of Geosciences, University of West Georgia) and James K. Feathers (Department of Anthropology, University of Washington)

[243] *Microbotanical Analysis of Carolina Bay Sand Rims: Reconstructing Holocene Vegetation and Paleoenvironment through Phytolith Analysis*

Carolina Bays are shallow, upland ponds that have provided important wetland resources to prehistoric populations dating back to the Paleoindian period. Sites are located on the bay rims (water-lain and eolian shoreline deposits), generally characterized by visually undifferentiated sand rich sediments. Recent geoarchaeological research by Moore and others that incorporates OSL and 14C dating, as well as microsampling at 2.5 cm intervals, provides chronologic and stratigraphic control at three Carolina Bay sites (Flamingo Bay, Johns Bay, and Frierson Bay) found on the South Carolina Coastal Plain. This has enabled interpretation of Holocene palaeoenvironment based on physical and chemical data. Due to acidic conditions and coarse sediment texture, sparse paleobotanical data have been recovered from these sites. Silica phytoliths, however, with their resistance to chemical and physical degradation, provide a reliable microbotanical proxy for palaeoenvironmental change in these settings. This study presents the results from a phytolith analysis of ten samples collected from the Flamingo Bay site (38AK469). The phytolith results are integrated with the geoarchaeological results to examine changes in Holocene vegetation and climate. By investigating the types of vegetation near the site, this phytolith analysis sheds light on prehistoric resource availability in Carolina Bay environments.

McNeill, Fiona [51] see MacDonald, Brandi Lee

McNiven, Ian (Monash University, Australia)

[163] *Discussant*

McNulty, Kieran [94] see Greer, Sean

McPherron, Shannon [10] see Dibble, Harold

McPherron, Shannon (Max Planck Institute)

[155] *Modeling Trampling Damage on Flakes: An Experimental Approach to Substrate Size, Raw Material Type, Edge Angle, and Contact Face*

Very little is known of the use of unretouched flakes during the Paleolithic. This is a considerable gap in our understanding of ancient lifeways. Studies of damage on the edges of unretouched tools may help to address this issue. Unfortunately, there is currently substantial equivitability in determining the behavioral relevance of macroscopic damage patterns. Experiments demonstrate that considerable damage is caused by trampling, and that this can be mistaken for use related damage. Factors that predict patterning in trampling damage are still poorly understood. We trampled flakes made from different raw materials on different sized gravel substrates. We controlled the surface (interior or exterior) exposed to the gravel. Damage patterns were investigated relative to variance in edge angle based on pre-trampling measures of edge angles equally spaced around tool edges. We explore differential patterning of damage using digitized tool outlines. Preliminary results suggest a signature of damage resulting from trampling. If confirmed this will provide a baseline for identifying residual patterning resulting from use.

[10] *Chair*

McTavish, Rachel (University of Wisconsin-Milwaukee)

[173] *Evaluating the Aztalan Palimpsest: Faunal Analysis of a Mixed Late Woodland and Middle Mississippian Context*

Archaeological contexts at the Aztalan site (47JE0001) in southeast Wisconsin typically reflect a mix of Late Woodland and Mississippian materials. This paper examines the faunal remains excavated by the 2011 UWM Advanced Archaeological Field School from one such culturally ambiguous context at the site. A total of 7,743 vertebrate and 3,343 invertebrate remains recovered from a midden context outside the eastern palisade were analyzed. This is compared to reported assemblages from four other Late Woodland sites in Southeastern Wisconsin. Results are used to discuss variation in Late Woodland and Mississippian patterns of faunal exploitation.

[173] *Chair*

Meadow, Alison [111] see Rockman, Marcy

Meadow, Richard (Harvard University)

[245] *Discussant*

Means, Bernard (Virtual Curation Laboratory)

[29] *Geographic Variation in New Deal Archaeology Across the Lower 48 States*

An examination of New Deal archaeology survey and excavation projects across the lower 48 states has revealed considerable geographic variation in the nature and extent of work relief archaeology projects. Some of this variation can be linked to strong regional personalities (e.g. William S. Webb and Tennessee Valley Authority archaeology), while other variation depended on local political acceptance or resistance of New Deal programs in general. In some cases, the nature of the archaeological record itself influenced the amount of New Deal archaeology conducted within a region. One challenge to examining geographic variation in New Deal archaeology is the fact that much of this work is unpublished or is only published in low circulation local archaeology or local historical society journals. Other challenges include the lack of specificity of the type of relief agency that funded individual archaeology projects, which renders it difficult to find further information. How an examination of geographic variation in New Deal archaeology can contribute to

understanding the development of American Archaeology is addressed as well.

[29] Chair

Meanwell, Jennifer (MIT)

[229] *A Petrographic Analysis of Domestic Pottery Consumption at Calixtlahuaca*

Petrographic analysis is a powerful tool, allowing the archaeologist to examine clay sources and aspects of production, such as firing temperatures, tempering materials, and manufacturing techniques. In this study, pottery from two separate domestic contexts, one likely elite, is examined through time to determine if pottery production or consumption patterns altered with the introduction of new ceramic forms (comals) and wares from the Aztec Empire. Earlier petrographic studies of the surface collected material suggest that the majority of the ceramics used in Calixtlahuaca were locally produced, although some variation in clay source and firing temperatures was noted. The current research will allow us to evaluate whether production and consumption patterns varied either with time (due to the Aztec conquest) or with status.

Medina, Paulo (Boston University)

[290] *Architecture that Infers Violence at El Mirador: Assessing Warfare in the Preclassic Period*

This paper presents archaeological data collected in 2008, 2010 and 2011 from El Mirador to assess Maya warfare during the Late Preclassic (400 B.C. – A.D. 250). One school of thought argues that warfare prior to the Late Classic (A.D. 600) was largely ritualistic. If true, it would preclude the need for large scale defensive features prior to this time. The other school believes warfare played a major role in the rise of complexity as early as the Middle Preclassic (600 B.C.). I document a feature called "El Muro Perimetral," the Wall, one of the features that enhanced the defensive posture of El Mirador. A survey of the Maya lowlands shows that defensive features were a regular component of Preclassic architecture. No evidence was found to support the claim that Preclassic warfare was ritualistic. Instead, considerable evidence shows that massive expenditures were directed at making site cores defensible. This suggests that warfare was a serious concern during the Preclassic.

Medina González, José (INAH/Zacatecas) and Baudelina García Uranga (INAH/Zacatecas)

[252] *La Turquesa en Alta Vista, Narrativas versus Evidencias*

En los años setenta del siglo XX, gracias a los análisis por activación neutrónica se descubrió que varias piezas de turquesa recuperadas en diversos sitios arqueológicos en el norte de Zacatecas pertenecientes a la Rama Suchil de la cultura Chalchihuites, provienen de yacimientos mineros en Nuevo México en los E.E.U.U. y de Concepción del Oro en los límites de Zacatecas con Coahuila en México. No obstante, ningún espécimen de turquesa del centro ceremonial de Alta Vista-Chalchihuites fue sometido a dichos análisis. Las excavaciones realizadas en este sitio arqueológico, obtuvieron piezas cortadas, cuentas y mosaicos de turquesa, así como algunas herramientas utilizadas en su manufactura dentro de contextos arqueológicos fechados entre 500/550 d.C. y 680/800 d.C. Estimaciones incorrectas sobre la cantidad real de turquesa y del número de herramientas antes mencionadas, condujeron a la exagerada interpretación que "Alta Vista es el taller más grande de turquesa [se calcularon 17,000 o 18,000 piezas] a la fecha encontrado en la arqueología norteamericana y mesoamericana". En esta ponencia se expondrán datos no publicados y recientes análisis realizados de la turquesa en este sitio con el fin de ofrecer una interpretación más acorde con el registro arqueológico recuperado.

Medina-González, Isabel (ENCryM-INAH)

[252]

Archaeological Conservation: A Tool for Preserving and Researching Turquoise Artifacts from Alta Vista, Zacatecas

During November 2009, a group of professors and students from ENCryM-INAH had the opportunity to participate in the conservation of one of the richest and comprehensive collection of turquoise artifacts of Mesoamerica, mainly rings and mosaics, which are currently exhibited at the new Museo de Sitio of the Archaeological Site of Alta Vista, Zacatecas. During the diagnosis of this collection, the restorer's close and detailed observations uncovered key aspects regarding the process of manufacture, deterioration, and conservation of each artifact. This information did not only provide fresh data for the documentation of the collection, but also was essential for the decision making process regarding the restorer's intervention for preserving the values of each turquoise item. This paper focuses on the analysis of these research achievements and the questions that derived from them, which nowadays direct an investigation about turquoise artifacts from the perspective of the field of archaeological conservation.

Megyesi, Mary [251] see Pilloud, Marin

Mehta, Apurva [253] see Walton, Marc

Meierhoff, James (University of Illinois at Chicago)

[92] *World War II and the American Home Front: A Preliminary Exploration of Three German POW Camps Near Chicago*

As Europe was being destroyed for the second time in 40 years, American cities and their hinterlands during World War II lay unscathed. However, the war would come home to America in the form of hundreds of thousands enemy prisoners of war. Imprisoned in almost every State in the Union, interactions with these prisoners were often the only link between the war raging in Europe and the American home front. The story of these men, and the United States' methods of housing and caring for them, is largely forgotten amid the larger and more dramatic events that occurred 1941-1946. This paper explores three World War II German Prisoner of War camps located in the Chicago suburbs. These camps, which held over 200 prisoners each, were established to utilize captive labor in civilian agricultural industries while millions of American men fought in the European and Pacific theaters of war. The initial archaeological pedestrian survey has confirmed that despite the apparent destruction and subsequent abandonment of these camps, the POW occupation surface still lay intact. These camps were branch camps of larger Fort Sheridan, and comprised of veterans of the African Campaign who were put to work in suburban truck farms.

[92] Chair

Meissner, Nate [36] see Yacubic, Matt

Mejia Appel, Gabriela (Dirección de Salvamento Arqueológico)

[17] *Eating Patterns of the Population of Teopancazco through PIXE Analysis*

This paper is the result of interdisciplinary research, which analyzed the food consumption patterns in Teopancazco, Teotihuacan. The central hypothesis is that, through dietary studies, we can understand some aspects of the cultural life in ancient populations because sustenance is tied to different social processes.

This analysis was conducted on a sample of the neighborhood center's population with the Particle-induced X-ray Emission (PIXE) technique for the paleodietary study of trace elements. The results allow us to approach the multi-ethnic population that lived in Teopancazco at different stages of its occupation during the Classic period.

Melgar, Emiliano [252] see Ruvalcaba, Jose

Melgar, Emiliano (Posgrado UNAM)

[252] *The Manufacturing Techniques of the Turquoise and Blue-Green Objects in Mesoamerica*

In different sites of Mesoamerica, the archaeologists have found several turquoise and blue-green objects, like inlays assembled as mosaics and beads and pendants as necklaces and strings. Unfortunately, most of the studies about those objects had been focused on the symbolic meaning, its morphology, trade and use, but very few studies focus on the manufacturing techniques and the organization of their production. In this paper, I will present the technological analysis of the manufacturing traces that I applied on turquoise and blue-green inlays, beads, and pendants, from different sites of Mesoamerica, like Chiapa de Corzo, Teteles de Santo Nombre, Monte Albán, Alta Vista, Cerro Moctehuma, Pajones, El Bajío, Xochicalco, Tula, El Salitre, Chevá Cave, Ejutla Cave, Tlaxiaco, Tamtoc, Nevado de Toluca, and Tenochtitlan. To analyze the manufacturing traces of these pieces, I employ experimental archaeology and Scanning Electron Microscopy (SEM). This methodology allowed us to identify the lithic tools employed in their production with great accuracy and distinguish different technological styles and local and foreign lapidary traditions.

[252] *Chair*

Mendelsohn, Rebecca (University at Albany, SUNY)

[185] *The Effectiveness of Low-Cost 3D Alternatives for Archaeology and Museums*

Archaeologists often overlook the use of 3D technology in cultural heritage, as they find the technology too expensive or the learning curve for 3D techniques too steep. This study analyzes the results of two user-friendly and cost-effective 3D techniques for medium and small-sized objects, and comments on their advantages and disadvantages. The first method employs close-range photogrammetry. It uses a standard digital camera to capture images of the objects and combine them in a software program to create a 3D image. The second method uses a low-end laser scanner to capture data points and develop them into a 3D model. The study seeks to determine, in what circumstances are low-cost 3D methods the most effective? What are the limitations of low-cost alternatives? How does the size of the object impact the effectiveness of these techniques? How feasible are these methods for use in the field? The study concludes with a discussion of the myriad ways 3D models can be effective research and teaching tools in archaeology and museum studies.

Méndez Melgar, César (Universidad de Chile), Omar Reyes (Centro de Estudios del Hombre Austral, Instituto d), Amalia Nuevo Delaunay (Instituto Nacional de Antropología y Pensamiento L), Juan García (Universidad Católica de Chile) and Charles Stern (University of Colorado)

[26] *Holocene Human/Environment Dynamics along the Eastern Andean Flank of Central Patagonia (Aisén Region, Chile)*

The forest steppe ecotone at the eastern slope of the Andes in the Aisén region (43°40'-49°15' S, Chilean Patagonia) provides a singular opportunity for assessing long and short term mutual responses between prehistoric/historic occupations and the environment. As a demographically marginal zone, northern Aisén developed an unstable dynamic equilibrium where the presence and absence of human beings during the Holocene can be understood as responses to climate change. On the other hand, human presence also produced measurable effects on the environment, especially through fires. By integrating archaeology, paleoecology, and geomorphology, we have investigated the following methodological approaches for evaluating these interactions. Evidence of human occupations starting at 11500 cal

B.P. is positioned within the regional geomorphologic framework and paleoclimate reconstructions for the last 19000 cal B.P., as obtained from a pollen record at Lake Shaman sediment core. Peaks/troughs of charcoal from this record, compared with series of 14C dates from the archaeological sites provide insightful means for assessing the magnitude of human effect on the environment. ICP-MS obsidian sourcing and isotopic ecology are used as means for establishing mobility and space use through time.

Menendez, Damaris [65] see Navarro-Farr, Olivia

Mentesana, Roberta (University of Sheffield - UK), Peter M. Day (University of Sheffield - UK) and Simona Todaro (University of Catania - IT)

[288] *Pottery Manufacture in Phaistos: Continuity and Change over Two Millennia*

Phaistos, a site in the Messara Plain of Central Crete, is perhaps best known for the building of a court-centered building or "palace" at the beginning of the second millennium B.C. The innovative and highly accomplished polychrome pottery of the palatial period has overshadowed the early ceramic history of this important site, which sees intense human activity from the Final Neolithic period onwards (ca. 3600-1460 B.C.).

A recent detailed study of the early phase stratigraphy and pottery has revealed that since the first phases of occupation the site of Phaistos was involved in periodic consumption events and that a pottery production area may have operated in the western slope of the site.

Pottery of these early phases has been analyzed with a multi-technique approach, consisting of PE and SEM analysis, revealing idiosyncratic ways of forming, of the combination of different pastes and of choices and manipulation of raw materials.

The longevity of these "ways of doing" lies in contrast to the major social transformations that the timespan of our study encompass, notably the transition from the Neolithic to Early Bronze Age and the establishment of the "palace," a trait of the emergent Cretan states.

Mentzer, Susan [76] see Thompson, Jessica

Mentzer, Susan (Eberhard Karls Universität Tübingen)

[224] *Approaches to Integrating Multiple Geoarchaeological Analytical Methods in the Study of Archaeological Features*

The micro-contextual approach to the study of archaeological features utilizes a variety of microscopic analytical techniques to document the internal spatial organization and chemical compositions of anthropogenic materials. Developed for the study of hearths and other combustion features, this approach typically includes petrography paired with molecular spectroscopy, with all analyses conducted on one micromorphological thin section or resin-impregnated slab of sediment. Using an expanded suite of analytical techniques suitable for micromorphological blocks and closely-associated loose samples, this approach can be employed in the study of many types of archaeological features and sediments. Examples presented here span the Middle Stone Age through the Neolithic and include: 1) the integration of micromorphology, elemental compositional analyses, and stable carbon and oxygen isotopic analyses in the study of calcareous plasters; 2) radiocarbon dating and botanical analyses coupled with micromorphology and reflectance petrology in the study of deposits containing charred plant materials; 3) the integration of micromorphology, observation of materials in grain mount, elemental compositional analyses, and the extraction of soluble salts for the study of dung and stabilizing deposits; and 4) the use of micromorphology paired with μ -XRF or μ -FTIR to aid in the collection and interpretation of luminescence and uranium-series dating samples.

Mercader, Julio

- [103]** *Plant Microbotanical Data from Middle Stone Age Sites to Understand the Environments in which Early Modern Humans Lived*

The detection of areas suitable for hominins during late Pleistocene drought intervals is currently a priority for Middle Stone Age research. Predicting the location of populations and dispersal pathways through the East African Rift System during the last glacial phase is a challenging task due to scarce direct archaeo-vegetation data. We present a Mozambican phytolith record spanning 105-29 ka and argue for the necessity and utility of using local plant microbotanical data from archaeological sites to understand the past environments in which early modern humans lived. We assess biome structure, spatial variability, and compare phytolith-based to lacustrine environmental reconstructions to conclude that dense wooded landscapes dominated the area over much of the last glacial phase. Archaeological and botanical data suggest the hypothesis of a palaeodispersal along a montane woodland archipelago that could have attracted hominin settlement and facilitated dispersals through an inland bridge that connected Southern, Central and East Africa, and the two branches of the East African Rift System.

Meredith, Clayton [217] see Jerrems, William

Merrett, Deborah C. [38] see Zhang, Hua

Mesia, Christian (Museo de Arte Precolombino Casa del Alabado)

- [180]** *Feasting and Power during the Andean Formative: Interactions between Chavín and Cupisnique*

Evidence for feasting activities has been identified in a midden located in the Wacheqsa sector at Chavín de Huantar. Deposits from the midden were formed from waste produced by collective consumption of food and drink, in other words, suprahousehold feasts. Ceramic types, faunal remains, narcotic paraphernalia and exotic items together yield the evidence necessary to argue for a feasting explanation of the stratigraphy recorded in the aforementioned midden. The occurrence of feasting at Chavín de Huántar carries implications for the interpretation of power strategies and corporate activities sponsored at Chavín during the Andean Formative. Feasting at Chavín de Huántar was a way to materialize power. It was an avenue for authorities' propaganda, a way to control ritual knowledge and entice people into the system, an opportunity for display of success. The evidence from Chavín is contrasted with the existing evidence published for Cupisnique sites from the Peruvian north coast in order to compare scale, strategies and feasting paraphernalia between Chavín de Huántar and its ceremonial counterparts from the Peruvian north coast.

Meskell, Lynn [32] see Pearson, Jessica

Messenger, Lewis (Hamline University)

- [58]** *Could Tsunamis Have Influenced Ancient Maya Cultures?*

This paper considers the tectonic potentials and geological and historical evidence for tsunamis in the Caribbean Basin, identifies what parts of the Caribbean region might have been affected, and hypothesizes the potential influence of tsunamis on the cultural trajectories of ancient Maya peoples on the eastern coast of the Yucatan Peninsula. The devastation of the 2004 Indian Ocean tsunami indicated the need for tidal-warning systems and action plans for countries bordering the Indian Ocean and led to development of warning systems and action plans for other tectonically active regions of the world. Prior to this, much discussion focused on the Circum-Pacific "Ring-of-Fire" area, further fueled by the 2011 earthquake and tsunami in Japan.

These recent disasters have led to reevaluation of earthquake and tsunami potentials for other parts of the world, including the Caribbean Basin. Geological conditions suggest the potential for such future catastrophic events in parts of the Caribbean Basin. Since the European arrival there, we have some historical references to eruptions as well as tsunamis. Such geological preconditions suggest that paleotsunamis may have affected the Mesoamerican Caribbean littoral, thus encouraging attention to potential archaeological and geological paleotsunami indicators.

Messenger, Phyllis (University of Minnesota)

- [257]** *Gender, Archaeology, and the Pedagogy of Heritage*

Since the seminal article by Conkey and Spector in 1984 calling for an archaeology of gender, a robust body of literature and theory on archaeology and gender has developed. Gendered aspects of archaeological practice include work relationships, divisions of labor, communication and cognitive styles, and specializations. This paper will discuss what feminist archaeologists have to say about the use of multivocality, multilinear narratives, and active engagement and collaboration to de-center archaeologists' knowledge claims and open space for community-based frameworks of heritage work. It will also address the lingering impact of gender inequality in the profession, heard through the stories of mid-career heritage professionals. It will conclude with the lessons we can learn from these stories and the work of feminist archaeology in order to develop a pedagogy of heritage that serves all.

- [257]** *Chair*

Messersmith, Mallory (University of Alabama at Birmingham) and Mark McCoy (University of Otago)

- [5]** *Airborne LiDAR Survey of Fortified Earthwork Sites in Northland, New Zealand*

Maori constructed some +6,000 fortifications, called pa, in the pre- and early post-European contact era. But, few of these sites have been surveyed at a level of detail necessary to evaluate the commonplace ditch-and-bank feature as a defensive strategy. The research presented here explores the utility of airborne LiDAR-derived remote sensing to advance this aspect of research in New Zealand. Digital elevation models (DEMs) and digital terrain models (DTMs) for several known sites in the Northland region of New Zealand were used to measure key functional aspects of ditch-and-banks at three fortified earthwork sites (pa). These results were ground truthed using traditional archaeological methods (handheld GPS, and tape and compass) to evaluate the accuracy of LiDAR surface modeling. The results support the notion that LiDAR can provide an accurate and cost-effective method for quantitative analysis of these archaeological features. Furthermore, the resulting measurements contribute to our understanding of Maori fortifications. This work was funded by the National Science Foundation's East Asia and Pacific Sumer Institutes program.

Metcalfe, Jessica (University of British Columbia) and Fred Longstaffe (Western University)

- [219]** *Paleoenvironments of the Great Lakes Region Inferred from Stable Isotope Analysis of Mammots and Mastodons: Implications for Clovis People*

The first humans in the Great Lakes region arrived around 11,000 14C yrs B.P., at a time when mammoths and mastodons still inhabited the lands exposed by glacial retreat. In this study, we use stable isotope analysis of mammoth and mastodon bones and teeth to reconstruct aspects of the climate and environment of the Great Lakes region (Ontario and New York) during and prior to the arrival of Clovis-era humans. This approach allows secure chronological control, since bones and teeth can be directly dated. It also provides climatic information at a "human" time-scale (i.e., local seasonal and annual environmental changes), in contrast to

the longer-term and/or global climate variations recorded by other proxies. Our data support the expectation that mammoths and mastodons inhabited distinct environmental niches. Serial sampling of mastodon tooth enamel reveals regular seasonal variations, with distinct patterns among individuals. We discuss the potential of these data for reconstructing seasonal changes at precise moments in time, and their implications for understanding human responses to environmental change.

Meyer, Matthias [20] see Thalmann, Olaf

Meyers, Maureen

[24] *Exchange, Control, and Power at a Mississippian Periphery: The Fourteenth-Century Carter Robinson Chiefdom*
 Excavations at the Carter Robinson mound site in southwestern Virginia have expanded our understanding of Mississippian peripheries by providing detailed excavations of a late prehistoric frontier chiefdom. The migrant inhabitants located themselves at the periphery to more directly control production and movement of trade goods. Ceramic analyses demonstrate that over time inhabitants increased their relations with local populations, resulting in a mixture of ceramic attributes. Concomitant with this change was an increase in craft production, and I suggest the two are closely intertwined. This examination of a Mississippian periphery highlights the role of exchange in border communities, and the effects of that role on local and regional populations at and beyond the core.

Meyers, Cory (Indiana University of Pennsylvania), Victoria Harding (Graduate Student Indiana University of Pennsylvania), Ryan Spittler (Graduate Student Indiana University of Pennsylvania) and Justin Daley (Graduate Student Indiana University of Pennsylvania)

[187] *Rediscovering Dragoo*

This poster presents the research conducted by the Advanced Graduate Field School at Indiana University of Pennsylvania on a Monongahela village site in Blairsburg, Pennsylvania. The primary goal of this project was to locate the western edge of the village being excavated for the Late Prehistoric Project run by Dr. Beverly Chiarulli and Dr. Sarah Neusius. During excavation we located evidence of Don Dragoo's 1952 excavations at the Johnston Site (36IN2) and possibly an additional outer stockade of the western edge of the village and an earlier occupation. Five 1 x 2 meter units were excavated in the western portion of the site. Four of the five units showed evidence of Dragoo's western excavation trench. Using maps from the Carnegie Museum in Pittsburgh we were able to line up Dragoo's findings with the features evident in our units. These five units provided a better understanding of previous excavations at the Johnston Site and the extent of the site. Artifact analysis supports the idea of a change in artifact use moving from east to west across all five units. Further excavations and research are needed to gain a better understanding of the entire site and the change in artifacts.

Mgeladze, Ana [226] see Varoutsikos, Bastien

Michel, Mark (The Archaeological Conservancy)

[110] *Protecting Sites through Ownership*

The United States is almost alone in the world in not protecting its ancient heritage sites no matter where they are located. Because of our strong national commitment to the rights of private property owners, privately owned archaeological sites in America have little or no legal protection. Instead, property owners are the legal possessors of all the artifacts and cultural materials on a private site. These owners are largely free to do as they like with the site – save it, loot it, or destroy it. Given these facts, the best way to preserve and protect privately owned archaeological sites is, in

fact, for responsible parties to own them. For more than 30 years The Archaeological Conservancy has been acquiring and permanently preserving archaeological sites throughout the United States. Acquiring land from willing sellers is a time-consuming process, but it is a successful one. In the Southwest, a large number of the region's most important sites are now permanently preserved.

Mickel, Allison (Stanford University)

[9] *Diary of the Day: Database to Display*

Since 1996, the Çatalhöyük Research Project has employed the use of diary-writing to encourage reflexivity and dialogue among members of the project. These diary entries represent an opportunity to write about hypotheses, interpretations, and findings without the constraints of prompts or forms. The platform was created to encourage dialogue between team members about developing theories, since anyone on site could read and respond to each others' diary entries. This year, there was a renewed focus on generating discussion amongst researchers within the diaries. The database was redesigned to allow direct, linked responses to specific diary entries, as well as tagging with keywords. Furthermore, as part of this effort, an excerpt from one diary entry each day was posted in two visible locations on site in order to encourage debate and discussion on the database. The hope was that making the diary entries part of the site's visible landscape would raise awareness about the diary database, generate excitement about its potential, and spark conversation between individuals who might not otherwise feel compelled to share their ideas. Here, I assess the efficacy of the 'Diary of the Day' endeavor and outline its particular effects on the information created in the diary database.

Mickleburgh, Hayley

[79] *Teeth Tell Tales: Dental Anthropology of the Precolumbian Caribbean*

This paper presents a selection of results from a dental anthropological study into diet and non-alimentary tooth use in the pre-Columbian Caribbean. The first of its kind in the region, this study includes 458 human dentitions from sites spanning the main Ceramic Age occupation phases and cultural areas of the archipelago (400 B.C. – A.D. 1500). The research combines bioarchaeological approaches including analyses of dental pathology, macrowear, and microwear (SEM), with evidence from previous archaeological, paleodemographic, paleoenvironmental, and stable isotope studies. Ethnographic and ethnohistoric sources are consulted to contextualize results.

This project has revealed considerable variation in dietary practices between sites, yet demonstrates agricultural intensification throughout the region over time. Sex differentiation in diet and non-alimentary tooth use was found in many sites. New insights into LSAMAT may help understand this pattern of wear in other regions. A single case of intentional dental modification in Cuba may evidence the first (forced) migration under the auspices of the European colonial powers.

For the Caribbean this study highlights the importance of bioarchaeological research. In a global perspective, this study contributes to the ever growing body of dental anthropological work dedicated to understanding past human culture and society.

Mickleburgh, Hayley [254] see Hoogland, Menno

Micklin, Destiny

[38] *The People of Actuncan: Locals or Migrants?*

Excavations at Actuncan in the upper Belize River valley revealed nine burials in a household patio group northwest of the civic core. Ceramic analysis dated three burials to the Early Classic period, approximating the other six to the Late and Terminal Classic. This poster uses isotopic analysis to explore two questions: do the individuals interred during Late and Terminal Classic originate

from different regions than those buried during the Early Classic? Do individuals buried in this location have origins differing from those interred elsewhere at Actuncan and the Belize River Valley?

Srontium, carbon and oxygen isotope analysis supplies key data for identifying population movement. Isotope values in the tooth enamel of 13 individuals provide information on food and water inputs during infancy and early childhood. Srontium isotope values from the Belize River Valley are distinct from those of the central and southern Maya lowlands, as well as the Maya Mountains and its foothills. Carbon and oxygen isotope analysis provides information on dietary staples and water source. Identifying the origins of the individuals at Actuncan allows for richer understanding of how the ancient Maya moved across the landscape in this region and how this movement affected the occupation of Actuncan.

Middleton, Angela (University of Otago)

[73] *Mission Archaeology in the Pacific: From Matavai Bay to the Bay of Islands*

Mission outreach into the Pacific began with London Missionary Society arrivals at Matavai Bay, Tahiti, in 1797. This initiated an evangelical network extending across the islands of the Pacific Ocean to Port Jackson (Sydney), and Bay of Islands, northern New Zealand. This expanding network of mission sites and personnel will be explored, along with an examination of the current state of knowledge of mission archaeology in the Pacific. Particular reference will be made to archaeological investigations at Hohi, New Zealand's first mission station and first permanent European settlement, and its successor at nearby Te Puna. These were examples of the 'household' mission, modeled on the Christian family, the male missionary as household head and the wife teaching domestic arts to indigenous Maori. Consideration will be given to how the New Zealand examples compare with other Pacific localities, and the shared and opposing characteristics of mission engagement across the region.

Middleton, William [264] see Hedgepeth, Jessica

Mihailovic, Dusan [80] see Boric, Dusan

Miksic, John

[104] *Highland-Lowland-Mainland Relations in Sumatra and the China Factor*

The highland-lowland diad has long been a staple of Southeast Asian studies. Some scholars have posited an antagonistic relationship analogous to that between pastoral nomads and settled farmers. Bennet Bronson in a much-cited paper developed a theory according to which lowlanders with access to imported technology and information exerted economic exploitation over highlanders. Almost all historical data on the highland groups of Southeast Asia originates from the lowlands. Recent archaeological research in Sumatra suggests that the position of the highland dwellers of Sumatra in intra-island economic networks was relatively equal to that of the populations of the lowland ports and their trading partners in mainland Asia. Earlier notions of dendritic patterns and gateway cities are being challenged by new archaeological discoveries, particularly in the headwaters of the Batanghari and the Batusangkar region of west Sumatra. The historical stereotype of the highlanders as subordinates of the lowland polities and their overseas trading partners in South and East Asia is gradually being replaced by a more complex picture. This paper will discuss the implications of recent archaeological research in Sumatra for the reconstruction of this relationship in the premodern period.

Milbrath, Susan (Florida Museum of Natural History)

[166]

Evidence for Astro-Agronomy among the Ancient Maya

Venus is closely linked with the solar cycle in Venus almanacs that integrate five Venus cycles with eight solar years. Use of this almanac spans from central Mexico to the Maya area, and it apparently originated in the Late Preclassic period. The earliest written reference to the Venus cycle appears on the La Mojarra Stela from Veracruz, where texts also refer to the annual cycle and a solar eclipse. An interest in Venus in the context of the eclipse cycle is apparent in Postclassic texts showing Venus appearing in an eclipse almanac of the Dresden Codex. Recent research on the Madrid Codex shows a similar interest in integrating the Venus cycle with eclipse events. This almanac depicts a repeating pattern of solar eclipses linked to Venus as the evening star at times of year that overlap with the agricultural cycle. Clearly Venus phases and eclipse events were closely watched in relation to the planting cycle, reflecting a form of astro-agronomy that we are only beginning to understand.

Miles, Wesley

[89] *Traditional Crop Production in the Middle Gila River Valley: An Experimental Study*

The Historic Akimel O'odham and the antecedent Hohokam material culture reflect an irrigated agriculture tradition spanning the past 2000 years in the Middle Gila River Valley. Hohokam canal systems involved the short-term management of available river water in addition to long-term management of agricultural soils across variable biotic communities and soil types. Ongoing experimental agronomic studies of traditional crops are being conducted on the Gila River Indian Community to better understand crop productivity in relation to soil quality and irrigation water supply. Traditional O'odham maize was grown during the second growing season of 2012 using ethnographically-observed planting techniques and crop density. Soil chemistry, soil moisture, precipitation, relative humidity, and temperature data were recorded for each experimental field plot. Grain production per plot is compared to environmental conditions, soil properties, and total irrigation supplied over the growing season. These preliminary data are used to refine models of ecological "risk landscapes" in the Hohokam case study area.

Millaire, Jean-Francois (University of Western Ontario), Flannery Surette (University of Western Ontario) and Jordan Downey (University of Western Ontario)

[19] *Entangled Pots and Rags: Luxury Object Making in the Virú Valley, Peru*

A broad-spectrum analysis of ceramics and textiles from the Virú Valley reveals fascinating processes of relational and material entanglement, allowing us to move beyond the "local-foreign" dichotomy and to question earlier, essentialist, periodizations of the region. Focusing on contextual data from the Early Intermediate period (200 B.C. – A.D. 800), this paper highlights how shifting trade relations with neighboring societies over the long term (Salinar, Moche, Recuay, Huari) has shaped luxury object making, and how these, in turn, may have shaped how foreign affairs were conducted. This focus on the entangled nature of object making also brings us to query the value of utilitarian and fancy ceramics and textiles as building blocks for archaeological chronologies.

Miller, G. Logan (Ohio State University)

[6] *Lithic Microwear Analysis of Hopewell Bladelets from Fort Ancient: Implications for Ritual Economy*

The Hopewell horizon in eastern North America is marked by the large-scale production, distribution, and deposition of ritual and craft objects. However, no clear model currently exists for the organization of production of these objects. It is generally assumed that they were produced at earthworks by individuals with special access to ritual knowledge and materials. If this is the

case then were the objects produced in households, specialized workshops, or communal spaces? Is there any evidence for changes in the pattern of production through time? This study addresses these questions through a large-scale microwear analysis of Hopewell bladelets recovered from several different contexts at the Fort Ancient earthworks. Results indicate that stone and copper artifacts were produced at Fort Ancient using bladelets. Additionally, some households, especially those in the interior household cluster, were more involved in craft production than others. Radiocarbon dates suggest that craft production may have shifted from corporate communal spaces to household production through time. All of these findings have important implications for the study of the Hopewell ritual economy and social organization.

Miller, Jennifer (University of Alberta)

[8] *Possible Middle Stone Age Ostrich Eggshell Beads*
Ostrich eggshell (OES) beads are some of the earliest forms of personal ornamentation; they can be found at many African archaeological sites and first appear in the late Middle Stone Age (MSA) or early Later Stone Age (LSA). This poster presents data from a newly excavated assemblage from Magubike rockshelter, which may have evidence of MSA OES beads. The site consists of a granite rockshelter in the southern highlands of Tanzania, and thus far has yielded evidence of occupation from the late Acheulean through modern times. The OES beads analyzed here were excavated in the summer of 2012, and were recovered from a sequence of stratified Historic/Iron Age and Middle Stone Age (MSA) levels, with no apparent Later Stone Age component. Approximately 100 beads and bead making materials were recovered, including 8 OES artifacts found in association with a MSA assemblage. If direct dating methods (possibly available at the time of presentation) confirm the antiquity of these MSA beads, they will rival beads from Enkapune ya Muto, Kenya, and Mumba Rock Shelter, Tanzania, as some of the world's oldest. These new artifacts from Magubike may provide insight into the early use of OES beads.

Miller, Naomi (Univ of Pennsylvania Museum-ISAW) and Ayse Gürsan-Salzmann (University of Pennsylvania Museum)

[30] *Plants and Politics: Preserving the Historical Landscape and Open-Air Archaeological Site at Gordion, Turkey*

Vegetation management on open-air archaeological sites can mitigate the deleterious effects of environmental conditions. Plants can also play an important aesthetic and educational role in site presentation. In the Gordion region of central Anatolia, more than 100 Phrygian tumuli and an extensive ancient settlement are outstanding features of the historical landscape. The tumuli date to the Phrygian period (ca. 800 BC). They are covered with remnants of the diverse native steppe vegetation, yet tumuli and biodiversity are both threatened by agricultural development. The excavated settlement mound is protected by an encircling fence, so plants grow unhindered. There, plant roots harm the walls of the exposed structures, and patchy growth makes it difficult for tourists to understand the site plan. Vegetation management is therefore critical for the preservation and interpretation of both types of open-air archaeological remains. This contribution presents straightforward technical solutions to a site-preservation problem whose implementation is strongly affected by local, national and international entities.

Miller, Melanie (University of California, Berkeley) and Christine Hastorf (University of California, Berkeley)
[74] *What Else Can Teeth Tell Us? Investigating the Socialization of Children through Food Using Stable Isotope Analyses*

Human teeth record the chemical signatures of foods consumed during childhood and can provide information about the dietary changes that a child experiences such as the age of being weaned from breast milk to a solid-food diet. Because food is dynamically

involved in the creation and expression of social identities, such dietary transitions are important indicators of new stages in the social life of a child. Through the lens of a life course approach, stable isotope data from human teeth can be used to track the social development and trajectory of individuals as their diets change from infancy through adolescence. Stable isotope data (carbon, nitrogen, and oxygen) from organic and inorganic fractions of human teeth from early settled inhabitants of the Taraco Peninsula, Bolivia will serve as a case study to investigate how childhood diet may be a way to understand the development of particular social identities that are distinguished through diet.

Miller, Myles (GMI)

[218] *A Millennium of Identity Formation and Maintenance in the Jornada Mogollon Region*

Social and ideological developments of the Jornada Mogollon region of southern New Mexico and west Texas are often considered peripheral to the greater Southwest. This perspective belies the fact that inhabitants of the region maintained one of the more successful and stable societies in the prehistoric Southwest. The fluorescence of Jornada style iconography in rock art, ceramics, and other media during the 14th century is well known. Recent chronometric and iconographic studies show that the underlying cosmology and ideology – the basis of Jornada ethnogenesis and identity - can be traced to as early as the 6th century and perhaps earlier. Over the span of several centuries, Jornada social identity was also expressed through agave fermentation and feasting, acts of ritual dedication and termination, ceramic technology, and orientations of rooms and settlements. The Jornada region offers a unique setting for the study of how identity was formed, conserved, and maintained over periods of several centuries.

Miller, Christopher

[224] *Deposits as Artifacts: Using Microfacies Analysis to Interpret Intrasite Settlement Dynamics*

Over the past few decades, micromorphology has become the key method in geoarchaeology for identifying and interpreting the roles played by geological, biological and human agents in the formation processes of archaeological sites. In particular, geoarchaeologists can use micromorphology to extract data and information from anthropogenic deposits on past human activities and behaviors. In this sense, by using the proper methods, geoarchaeologists can treat deposits as artifacts. A valuable concept in the analysis of deposits as artifacts is the microfacies concept. Originally developed in sedimentary petrology, the microfacies concept has been successfully applied to the geoarchaeological investigation of several types of archaeological sites. Distinct microfacies and microfacies associations can be linked to certain past human activities. In particular, because microfacies have an inherent spatial component, microfacies analysis of anthropogenic deposits can be informative about the spatial arrangement of activities within archaeological sites. Here, I discuss recent advances in the microfacies concept in geoarchaeology, particularly focusing on how it can be used to investigate intrasite settlement dynamics. As an illustration of the concept, I present data from Paleolithic and Stone Age hunter-gatherer sites from Germany and South Africa.

Miller, Heather (University of Toronto)

[245] *Discussant*

Miller, Melanie [263] see Porter, Benjamin

Mills, Peter [62] see Lundblad, Steven

Mills, Peter (University of Hawaii Hilo)

- [255] Current Perspectives on Hawaii's Stone Tool Economies**
 Patrick Kirch's publication of *Feathered Gods and Fishhooks* in 1985 coincided with the first detailed publication on the petrology of various basalt adze quarries in the Hawaiian Islands by Paul Cleghorn and others. Both publications emphasized the value of stone tool sourcing studies in delineating precontact interaction spheres and the evolution of Hawaii's complex societies. Through the 1990s, however, sourcing studies included less than 200 specimens in any given analysis, which limited the ability of the analyses to generate well-substantiated conclusions related to adze production through nearly a millennium of Hawaiian prehistory. With the introduction of geochemically-based analyses of archaeological basalt and volcanic glass in Hawaii, first by Marshall Weisler and later by geoarchaeology labs in Oregon, Hilo, Otago and Queensland, over 21,000 samples have now been analyzed. A review of the expansive data set is presented. Findings point to regionally divergent patterns in adze production and distribution, and the existence of multiple quarries that could rival the well-known Mauna Kea adze quarry in their extent of interisland distribution.

[73] *Discussant*
[142] *Chair*

Mills, Barbara (University of Arizona)

- [106] Multiscalar Perspectives on Social Networks in the Late Prehispanic Southwest**
 The application of social network analysis (SNA) to archaeology is closely tied to historical trajectories and interactions occurring across widely varying social and spatial scales. Rather than seeing this as an impediment to the application of social network analysis in archaeology, we show how changing the regional scale of inquiry can lead to different yet complementary interpretations about the relationships among settlements. Using decorated ceramic frequency data from the Southwest Social Networks Project we present the analysis of three different spatial scales over time to show how the same social processes of migration in the 13th century followed by widespread religious movements in the 14th and 15th centuries were expressed in terms of their network characteristics. In the southern Southwest these processes resulted in a highly connected network with many long-distance connections, while in the northern Southwest networks were more discrete with more short-distance connections. We look at several network measures to better understand how these different network "textures" emerged and compare them to independently documented differences in ceramic production, population density, and migration histories.

[161] *Discussant*
[106] *Chair*

Minc, Leah, Jason Sherman (University of Wisconsin-Milwaukee), Christina Elson (Science Visualization), Charles Spencer (American Museum of Natural History) and Elsa Redmond (American Museum of Natural History)

- [178] Clay Survey and Ceramic Provenance in the Valley of Oaxaca: Mapping Out Pottery Production and Exchange in the Late to Terminal Formative**
 The Oaxaca Clay Survey was initiated to map trace-element and mineralogical variation in clay composition as a basis for determining ceramic provenance. Natural clays have now been sampled from more than 250 locations throughout the valley, and analyzed using INAA in combination with ceramic petrography. Spatial averaging was used to create a series of smoothed "topo maps" showing how element concentrations vary over space, and to generate a regular reference grid of concentration values against which ceramics could be compared. Here we apply this continuous spatial model to the task of sourcing pottery ($N=430$) from the Late and Terminal Formative periods (500 B.C.E. - 200

C.E.). We focus on the Valle Grande (Ocotlán-Zimatlán region), in order to examine the regional organization of pottery production and extent of ceramic exchange among key regional and local administrative sites during the era of early state formation. By providing a robust means for monitoring exchange at the intra-valley level, the clay survey and ceramic provenance determinations allow us to revisit long-standing models for craft production and market system development, and force us to reexamine the relationship between political and economic processes in the Valley of Oaxaca.

Minturn, Penny [251] see Esh, Kelley

Miranda, Paula [168] see Scheinsohn, Vivian

Misarti, Nicole (Water and Environmental Research Center), Luis Borrero (CONICET-IMHICIHU, UBA), Manuel San Roman (Universidad de Magallanes), Herbert Maschner (Idaho State University) and Bruce Finney (Idaho State University)

- [26] Marine Paleo-Food Webs from Southernmost Patagonia: Tracing Human Resource Use by Geographic Area through Stable Isotope Analysis**

The archaeological records of the coastlines of southern Argentina and Chile are well preserved and provide data critical to understanding the effects of climate change on humans and the marine ecosystems they relied upon. Preliminary isotopic analysis (C and N) of 290 bird, fish and sea mammal samples from archaeological sites spanning 7000 years in both regions provide evidence of changes in marine ecosystems based on geographic location. This affects how researchers should interpret differential resource consumption by humans across these areas. Species analyzed include southern sea lion (*Otaria flavescens*), southern fur seal (*Arctocephalus australis*), cormorant (*Phalacrocorax* sp.), penguin (*Aptenodytes patagonica* and *Eudyptes chrysocome*), gull (*Larus dominicanus*), fish (*Eleginops maclovinus* and *Salilota australis*) and human (*Homo sapien*).

Misarti, Nicole [45] see Barnes, Kelli

Mitchell, Patricia (kp environmental, LLC)

- [92] Camp Young Revisited**

Camp Young (CA-RIV-1117) was the first divisional camp for General George S. Patton's Desert Training Center/California-Arizona Maneuver Area (DTC/C-AMA) during World War II and served as his headquarters. It was one of the more permanent facilities and contained the most improved quarters of the divisional camps. The entire Camp has not been physically inspected to determine what does or does not remain, and although the main living quarters for the camp were located north of Interstate 10 in the 1970s, it is the outlying ranges and associated resources located south of the freeway that have had focused fieldwork conducted in the past decade. Since the work was required by CEQA or NEPA only the resources located within the footprint of each project have been documented. kp environmental revisited the site in the spring of 2011 for the 110-mile Desert Southwest Transmission Line Project and expanded on the southern boundary use area of Camp Young. This presentation provides a historical view of Patton's headquarters and the projected reconstruction of the divisional camp and DTC/C-AMA activities derived from those studies.

Mitchell, Myles [165] see Guilfoyle, David

Mixer, David (Washington University in St. Louis) and Lisa LeCount (The University of Alabama)

[256]

Dating Actuncan: Contextualizing Social and Political Transitions within a Long-Lived Maya Center

Recent research at the Maya site of Actuncan, Belize has revealed a long occupation history dating from the terminal Early Preclassic to the Early Postclassic periods. In the absence of hieroglyphic texts, local ceramic sequences and radiocarbon dates must be used to place Actuncan within historical context. Ceramic dating indicates that Actuncan was subject to boom and bust cycles that correlate with demographic shifts in early settlements and later political power dynamics within the upper Belize River valley region. This paper presents the results of recent radiocarbon dating at Actuncan. Our absolute dating strategy includes samples from civic and household contexts from across the site as well as those from a complex building sequence associated with a long-lived elite house. We focus on dating major milestones within the site's history – its initial occupation associated with Early Preclassic Cunil ceramics, the Late to Terminal Preclassic transition to divine kingship, the collapse of the site as a major Classic period center, and its reestablishment as a post-royal political center during the Terminal Classic period. These dates will more securely situate Actuncan's social and political transitions and provide insight into the participation of individual households in these transitions.

Miyamoto, Kazuo (Kyushu University)

[216]

Reconsidering Modes of Contact between the Northern Chinese Bronze Culture and Those of Southwest China: The Crescent-Shaped Exchange Belt Reconsidered

This paper resolves the question of the dating and chronology of stone cist graves containing bronze artifacts in the Southwest China, according to the results of Sino-Japanese joint excavations conducted on stone cist graves in Sichuan Province of China between 2008 and 2010. It is furthermore argued that the emergence of bronzes in this area might be connected with bronzes from Northwest China, suggesting that the model of the Crescent Exchange Belt would need to be modified significantly. It will thus be reasoned that the bronzes in this area developed independently.

Mizoguchi, Koji (Kyushu University, Japan)

[106]

Prestige Goods and Social Hierarchization Revisited: A Formal Network Approach to the Hierarchization of Intercommunal Relations in the Middle Yayoi Period in Northern Kyushu, Japan

This paper shows that the monopolization of contacts with the Other, signified by the monopolistic acquirement and distribution of prestige goods, can indeed be the "prime mover" in social hierarchization. This was demonstrated by examining discrepancies between the intercommunal hierarchy simulated by centrality analysis methods of formal network analysis and that indicated by the differences in the contents of grave goods from the richest burials in the individual polities comprising the northern Kyushu Yayoi cultural horizon. The former shows that the highest centrality scores are achieved by those polities that occupy the geographical core of the northern Kyushu region whereas the latter shows that one of the highest-ranked burials of the region is actually located on the northwestern periphery of the network of interactions reconstructed by the distribution of prestige goods, such as bronze mirrors, imported from the Han Chinese outpost of Lelang. The polity where the burial existed neither had the largest population concentration nor enjoyed any particular advantage in food/material production, strongly suggesting that its position at the top of the hierarchized network was achieved by its geographical location, advantageous for contacts with Lelang.

[161]

Discussant

Moats, Lindsey (Texas Tech University) and Sarah Nicole Boudreaux (Texas Tech University)

[213]

Powerful Landscapes: A Glimpse of an Elite Settlement on the Dos Hombres to Gran Cacao Archaeology Project

In 2012, the Dos Hombres to Gran Cacao Archaeological Project (DH2GC) began the first formal excavations at N950, a medium-sized elite group located approximately one kilometer from the large Maya center of Dos Hombres in Northwestern Belize. The group consists of several sizable structures, the largest of which are located on a knoll, elevated above the surrounding area. The group shows extensive use and because of this the 2012 excavations at N950 focused on collecting chronological information about the occupation and possible function of the area. This paper will detail the results of the 2012 excavations focusing on initial occupation data gathered from archaeological excavations and laboratory analysis of artifacts recovered from the group. This information will then be used to make initial conclusions about the function of the N950 group and how it fits into the settlement patterns observed in the DH2GC Archaeological Project area.

Moe, Jeanne (Project Archaeology-BLM) and Crystal Alegria (Montana State University)

[269]

Absaroka Agency Volunteer Project: Longitudinal Learning Research

In July 2011, twelve volunteers from Montana and Wyoming participated in excavations at the Absaroka Agency. Staff from Project Archaeology, a national education program, designed and conducted the volunteer project. All volunteers attended a three-hour training session before excavating. Participant evaluations show that the volunteers considered this project worthwhile and expressed interest in participating in future volunteer projects. Telephone interviews conducted in the winter of 2012 indicate that many participants continued to learn about archaeology and Crow history after the field experience. This paper examines the efficacy of the learning experience and provides recommendations for volunteer excavation projects.

Mogetta, Marcello [105] see Opitz, Rachel

Mohanty, Sudarsana [108] see Serio, Jillian

Mohanty, Sudarsana and Jillian Serio

[108]

An Analysis of Burials found in Yschma Domestic Spaces at the site of Panquilmá in the Lurín Valley, Peru

The Yschma site at Panquilmá yielded two burials. The mummified remains of two individuals were discovered in the same unit; however, they were separate and exhumed from different layers. These burials were not found within the mortuary area of the site, such as a cemetery or mausoleum, but rather in the domestic sector of Panquilmá. Ancestral veneration could explain this blurring of boundaries within the organization of Yschma society, however the contextual information associated with the find is not consistent with typical methods of ancestor worship. The evidence lends itself to a different explanation worth investigating. The known burial practices of the Yschma describe notable changes in their mortuary behaviors upon the Inka conquest, but offer little explanation specifying what kind of changes were adopted. Through this paper we present the archaeological context and associated artifacts found within this unit with the intent of describing the ancient rituals which lead to the final resting place of these individuals within the domestic sector and in an attempt to relate this mortuary alteration to the effects of the Inka conquest, e.g. the shift in economic, political and religious power and control in the region.

Mol, Angus (Leiden University, Netherlands), Corinne Hofman (Leiden University) and Menno Hoogland (Leiden University)

[106]

Remotely Local: A Network Model of the

Fourteenth-Century Settlement of Kelbey's Ridge, Saba

The settlement of Kelbey's Ridge is located on Saba in the heart of the Northeastern Caribbean archipelago. During the past 25 years Saba has been the focus of intensive and extensive archaeological fieldwork undertaken by the Caribbean Research Group, Leiden University. Building on the archaeological relational datasets that have been collected during this period, this paper will investigate the role of Saba, specifically the site of Kelbey's Ridge, in the Late Ceramic Age network of the Northeastern Antilles. Several unique features of the island and the site testify to the fact that, although Saba itself is small (5 sq mi/13km²), its inhabitants were taking part in patterns of mobility and interaction that took place at the local, regional and interregional level. Through an ego-network approach the island of Saba will be shown to represent a microcosm of overarching, 14th century network processes and dynamics. By doing so this paper will contribute to the evolving view of Caribbean Late Ceramic Age patterns of interactions, approaches that seek to integrate varied archaeological relational datasets, and discussions on the status of "islands as units of analysis" in archaeological network studies and beyond.

[161] Moderator

Molenda, John (Columbia University)

[134] *Overseas Chinese Islands in the American West*

This paper uses Islands as a metaphor to explore similarity and difference in Overseas Chinese artifacts, sites, and landscapes along the first transcontinental railroad. A multiscale approach will be applied to archaeological residues of Overseas Chinese activities in the Tahoe National Forest dating from the 1860s-1880s. The author will present interpretive sketches at three distinct scales: a single artifact, a bounded site, and the landscape of the railroad itself to explore how differing scales of analysis allow 'the past' to 'show up' in different ways. Archaeological investigation will be presented as an engagement with a productive tension between methodological enclosure and interpretive disclosure.

Mollard, Priscilla (California Academy of Sciences/SFSU)

[272] *Integrated Studies of Maya Bioarchaeology and their Potential*

Maya archaeology is not typically known for its application of the bioarchaeological approach. Environmental factors belie the wealth of mortuary remains that are revealed through excavation in the Maya lowlands and yet, while artifacts from mortuary contexts are smoothly incorporated into the corpus of excavation data, the physical remains of the inhumed are often considered separately from their cultural contexts. An increase in integrated mortuary and bioarchaeological research would have the potential to shed light on crucial concepts such as health, diet and pathology among the ancient Maya, and could reveal trends associated with multifaceted issues such as demography, environment, status, and even the factors contributing to the Maya collapse. This work will serve as an overview of the immense potential that such integrated research has for the field of Maya archaeology, and will delineate the multiple lines of evidence that can be revealed by incorporating studies of the body and its material-mortuary context directly into the archaeological data. Furthermore it will be shown that the Maya population, particularly during the Classic Period, is an ideal sample population from which to both draw bioarchaeological data and to test and refine the methods by which these data are recovered.

Molle, Guillaume (CIRAP) and Eric Conte (CIRAP - University of French Polynesia)

[27] *New Investigations on Hane Dune Site (Ua Huka) and the Implications for the Colonization of the Marquesas Islands*

Since the first fieldwork conducted by Suggs, the Marquesas archipelago has remained at the center of discussions regarding the colonization of East Polynesia. One among several key sites, Ua Huka Island's Hane dune site proves particularly important. Previously excavated by Sinoto and Kellum in 1963-64, it demonstrated a complex stratigraphy associated with rich deposits of material remains. However, the oldest dates included in Sinoto's orthodox model of settlement for the region were later put into question.

Facing the problems of both the validity of the dating results and the interpretation of the stratigraphy, it was determined that the site demanded further investigation. In 2009, E. Conte and G. Molle directed a new fieldwork session, excavating 18 m² of the site and documenting 10 stratigraphic layers. Based on the consistency between the stratigraphy and associated radiocarbon dates, we are now able to reconstruct a chronological sequence from approximately 900 to 1650 A.D. Our results are integrated into a reflection about the colonization of the Marquesas Islands, highlighting the idea of initial settlement occurring at the end of the first millennium A.D. Our results are also compared to other chronological data sets recently obtained in the central archipelagoes of East Polynesia.

Monroe, Cara [38] see Lenci, Eric

Monroe, Cara (UCSB Anthropology and Washington State University), Eric Lenci (San Jose State University; Muwekma Ohlone Tribe), Alan Leventhal (San Jose State University College of Social Science), Rosemary Cambra (Muwekma Ohlone Tribe) and Brian Kemp (Washington State University Dept of Anthro/Sch Bio)

[79] *Ancient Human DNA Analysis from CA-SCL-38 Burials: Correlating Biological Relationships, Mortuary Behavior, and Social Inequality*

The Late Period (1000 YBP—European Contact) in the San Francisco Bay area of California witnessed an increase in social complexity as well as an emerging ceremonial and social interaction sphere that included similar treatment of the dead distinct from earlier periods.

These changes in mortuary treatment have been interpreted as either a reduction in overall inequality with a shift toward an egalitarian corporate group identity based on kinship or represent emerging elites that were increasingly differentiated from other segments of the community. Neither scenario is mutually exclusive. The predominately Late Period earth mound cemetery site of CA-SCL-38 ("Yukisma") located in the Santa Clara Valley of California suggests that the site was spatially structured according not just to age and sex, but also through a dual moiety system and/or elite status. Using an ancient DNA (aDNA) approach, we tested for correlations between the genetic relatedness of individuals, grave goods, and burial patterns. This will provide a direct examination of prehistoric mortuary practices and the emergence/maintenance of social inequality.

Monroe, J. Cameron (University of California, Santa Cruz)

[115] *State and Community in Precolonial Dahomey*

Scholars have long argued that sub-Saharan Africa in the era of the slave trade was dominated by ethnically distinct communities whose members underwent the process of cultural creolization only after being displaced to New World slave societies. Historical archaeological research across West Africa, however, is challenging this notion, revealing how the contours of West African cultural identity transformed dramatically in response to intersecting economic, political, and cultural forces unleashed by trans-Atlantic commerce. This paper examines the nature of cultural identity on the Abomey Plateau in the Republic of Bénin, the precolonial heartland of the Kingdom of Dahomey, focusing on the relationship between settlement history, political transformation, and Fon ethnic identity at Cana. Regional survey data reveals a long-term and dynamic history of settlement across

the region, extending as far back as the 1st millennium BC. However, urban landscape planning schemes initiated by Dahomean monarchs in the Atlantic Era all but erased the local memory of this deeply rooted history. The production of urban space in Dahomey was centrally important for gerrymandering social identities vis-à-vis the emerging state, providing new insights into complex intersections between space, power, and 'history-making' in the West African past.

Montenegro, Alvaro, Richard Callaghan (University of Calgary) and Scott Fitzpatrick (University of Oregon)
[47] *From West to East Polynesia: A Voyaging Analysis Using Two Complementary Computer Simulations*

The temporal gap between the colonization of West and East Polynesia has long been a controversy in the study of Pacific Island colonization. Here we present the results of two complementary computer simulations of voyaging between the two regions with the goals of determining if environmental factors were an issue in the proposed late colonization of East Polynesia and evaluating the programs against each other. The two simulation programs are dynamically and statistically based, respectively. Both simulations consider wind and current patterns, island distribution, mortality at sea, and sailor's navigational intent. The dynamical model, developed by the US Coast Guard, is based on fluid dynamics and deterministically computes vessel trajectory. It offers a representation of impact by environmental variability and is capable of accounting for the temporal and spatial autocorrelation of currents and winds. Speed and direction generated by the deterministic model have been validated against a large number of derelict vessel trajectories and historically documented voyages. The statistical model computes statistical probability of vessel trajectories under given physical conditions to generate a description of possible voyages which has been validated against historically documented voyages. Results highlight the importance of voyaging simulation studies for understanding human seafaring strategies and capabilities.

Montgomery, Barbara, Daniela Triadan (University of Arizona) and Nieves Zedeno (University of Arizona)

[64] *The Incidental Journeys of Three Pottery Queens*

We came from different parts of the world---Montgomery from the East Coast, Triadan from Germany, and Zedeño from Ecuador---and met at the Grasshopper Field School in the late 1980s, where we worked as graduate research assistants until its final year in 1992. Like so many others, our experiences and work at Grasshopper started and defined our careers. We became the ceramic ladies as we all did our dissertations on ceramics from Grasshopper Pueblo or Chodistaas Pueblo. After our Ph.D.s, however, we took flight again into very different directions.

Montgomery continued to work on ceramics with CRM companies in Tucson, although she expanded into Hohokam buff wares. Triadan went across the border to Chihuahua and back to her Mesoamerican roots and has been running projects at large Maya sites in Guatemala. And Zedeño has taken her interests in human mobility and migration to the Midwest and most recently to prehistoric and historic Plains buffalo hunters in Montana. The years at Grasshopper were formative, inspiring and fun, and laid the solid foundation for our careers in archaeology. Our journeys demonstrate the wide-ranging impact the University of Arizona Field School had on the discipline.

Montgomery, Christine (University of Wyoming), David Diggs (University of Northern Colorado) and Robert Brunswig (University of Northern Colorado)

[75] *Reconstructing a Prehistoric Ute Sacred Landscape in the Southern Rocky Mountains*
Reconstructing a prehistoric Ute sacred landscape in the southern Rocky Mountains of Colorado necessitates the integration of additional fields of study within the archaeological work. First, Ute consultations and ethnohistoric research strengthen the interpretation of sacred sites and provide information about how to

protect these places. Next, we utilize Geographic Information Systems (GIS) to analyze the connection between sacred places through their viewsheds and orientations and to examine the influence of geographical variables in predicting locations of other sacred sites. The synthesis of this information begins to reveal how and why the Ute inscribed their spirituality onto the landscape.

Montiel, Rafael (Laboratorio Nacional de Genómica para la Biodiversidad, Cinvestav-IPN), Brenda A. Alvarez-Sandoval (Langebio, Cinvestav-IPN) and Linda R. Manzanilla (Instituto de Investigaciones Antropológicas, UNAM)

[17] *Genetic Analysis in Teopancazco: Inferences on Multiehnicity*

Multiehnicity in Teopancazco is represented by foreign elements associated with the coast of the Gulf of Mexico, Puebla, Tlaxcala and Hidalgo, as well as by the variability observed in funerary rituals. Studies on both stable and strontium isotopes suggest the presence of three population groups, the locals, immigrants from nearby areas, and immigrants from more distant areas. However, to date no systematic genetic analysis has been conducted to address this issue. As a first approach to understand the genetic variability in Teopancazco, we conducted an ancient DNA (aDNA) analysis using a set of samples from different temporalities, activity areas, ages, and sexes. Estimates of both genetic and nucleotide diversity indicate high levels of genetic variability in Teopancazco, which is consistent with the multiehnicity phenomenon at the neighborhood center. Likewise, sex determination shows a differential ratio in the population analyzed, and the comparison of variability levels between men and women indicate a patrilocal residence pattern.

Montiel, Rafael [41] see Alvarez-Sandoval, Brenda A.

Montiel Ángeles, Alma [145] see Zapien Lopez, Victor

Montón, Sandra [95] see Cruz Berrocal, María

Montón-Subías, Sandra (ICREA Research Professor. Universitat Pompeu Fabra.)

[95] *Chair*

Mooder, Karen [77] see Moussa, Nour

Mooney, Susan Moorhead and P Gregory Hare (Government of Yukon)

[92] *The Arctic Trails Have Their Secret Tales...*

In November 2010, several deeply buried wooden coffins with associated human skeletal remains were accidentally uncovered by construction workers in Dawson City, Yukon, Canada. The graves were located within the area of historic Fort Herchmer, the North West Mounted Police post for the region, and provided evidence of an unmarked burial ground for individuals executed during the Klondike Gold Rush at the end of the 19th Century. The recovery and osteological analyses of these well-preserved remains offers insight into the quality of life during the Klondike Gold Rush, as well as the administration of justice in the Canadian frontier. This paper reviews salvage excavation activities and explores the identities of some of the first individuals to be executed in the Yukon Territory.

Moore, Jacy (University of Guam), Jasminda Ceron (University of Philippines, Diliman) and Stephen Acabado (University of Guam)

[7] *Agricultural Development and Settlement Patterns in Early Ifugao Societies*

Intensive agricultural systems commonly concentrate on a

particular crop to support the food requirements of a population. This appears to be the case among the Ifugao of the northern Philippines, especially, with the existence of labor-intensive and architecturally magnificent, rice terraces. Recent studies, however, indicate that the Ifugao agricultural system is composed of both intensive and non-intensive forms of agricultural production (wet-rice cultivation, upland swiddening, and agroforestry), a system that is associated with agroficultural and complementary complexes. Excavations in the Old Kiyangan Village (an early Ifugao settlement, c. 1000 YBP) provided important paleoenvironmental information on the development of such system, specifically, changes in the crops cultivated in the region. As such, this presentation provides material evidence on landscape changes and the role of agricultural and complementary systems in the development of Ifugao rice terracing tradition.

Moore, Jerry (CSU Dominguez Hills) and Carolina Vilchez (Proyecto Qhapag Nan, Ministerio de Cultura, Peru)

[59]

Techné and the Thorny Oyster: Spondylus Craft Production and the Inca Empire at Taller Conchales, Huaca Cabeza de Vaca, Tumbes, Perú

The creation of objects from the lustrous shells of the thorny oyster (*Spondylus princeps*) and the large rock oyster (*Spondylus calcifer*) was an important focus of embodied craft for over five millennia in Andean South America. *S. princeps* and *S. calcifer* are warm water species whose southernmost natural limits are coastal Ecuador and far northern Peru. *Spondylus* was highly-prized over a broad area of Andean South America, exchanged as whole valves, worked objects, and beads throughout much of prehistory and over thousands of kilometers.

The transformation of *Spondylus* shells into beads, pendants, and other objects underwent fundamental shifts in volume and focus in late prehistory, with major reorganizations occurring at circa AD 1470 as the Inca Empire expanded into northern South America. Excavations in 2011 at the site of Taller Conchales—a sector of the Inca provincial center Huaca Cabeza de Vaca in Tumbes, Peru—resulted in detailed insights into *Spondylus* craft production. The only known *Spondylus* workshop directly associated with the Inca Empire, data from Taller Conchales document the decisions and assessments by craft workers as they transformed shells into highly desired objects, providing a unique perspective into the techné of craft production in the Inca Empire.

Moore, Daniel (SIU Carbondale)

[117]

Earthen Architecture at Poggio Civitate, Italy

Over 400 fragments of daub with timber impressions and mudbrick were recovered from the destruction level of the protohistoric Etruscan building complex at Poggio Civitate, Italy. This paper will describe the system developed to classify the daub and mudbrick morphologically and the archaeometric and petrographic tests performed on samples retained for further study. The morphology and timber impressions left on the daub revealed that wattle-and-daub and mudbrick were used in tandem to construct the walls of the complex. Daub fragments also provided information about the construction techniques used to build the complex's gabled roof. Petrographic analysis and archaeometric tests (including thermogravimetric analysis (TGA), X-ray fluorescence (XRF), and laser ablation inductively coupled plasma-mass spectrometry (LA-ICP-MS)) were performed on samples of the daub and mudbrick fragments, as well as ceramics recovered from the complex and the plaster facing of the earthen walls. These tests revealed that the daub, mudbrick, and ceramics reached different firing temperatures, were likely sourced from separate clay beds, and experienced different formation processes. The TGA tests on the plaster suggested that the mixture used by the Etruscans imparted some hydraulic properties that would have helped to preserve the earthen walls and protect them from rain erosion.

[117]

Chair

Moore, Summer (Bishop Museum), Gina Farley (Bishop Museum) and Ashley Robinson (Bishop Museum)

[185]

Digitizing Archaeology Collections at the Bishop Museum: A Case Study from the Nu'alolo Kai Site

In the 1950s, archaeologists from the Bishop Museum in Honolulu, Hawai'i, began a systematic effort to better understand the chronology of Hawaiian settlement. One of the first archaeological sites investigated as part of this program was Nu'alolo Kai, a fishing settlement on the coast of Kaua'i that was excavated between 1958 and 1964. Thousands of artifacts, including fishhooks, domestic objects, and perishable items, were recovered from the site. In 2010, Bishop Museum's Anthropology Department launched the Hawaiian Archaeological Survey, an online database envisioned as a means for consolidating Hawaiian archaeological data. Currently, the database contains 12,800 entries for archaeological sites in Hawai'i investigated by the Bishop Museum. The Museum hopes to make artifact inventories for each excavated site, as well as field notes, archaeological maps, and artifact photographs, available to the public via the Internet as part of a process destined to last many years. Under this program, Nu'alolo Kai was chosen as the first site to have its artifact collections completely digitized. This poster presents an overview of the Nu'alolo Kai digitization project, with the aim of using it as a test case to explore the benefits of digitizing archaeology collections in museums.

Moore, Christopher R. [243] see McNamee, Calla

Moore, Kaitlyn (University of Arizona)

[264]

Negotiating the Middle Ground in a World-System: An Example from the Northern Rocky Mountain Fur Trade

The little known archaeology of the early fur trade in the northern Rocky Mountains (1796-1821) illustrates important processes of incorporation of remote colonies into a global political economy. This study focuses on two early nineteenth century trading posts in the northern Rockies--Rocky Mountain House and Kootenae House--where the North West Company engaged in trade with the Niitsitapi (Blackfoot) and Ktunaxa (Kootenai) respectively. A world-systems framework is used to explore the array of negotiative processes that occurred between trading parties as expressed on the landscape. Native and European groups mutually constructed a "middle ground" of trade in an expanding world-system. Material expressions of negotiation in the early fur trade are manifest in the phenomena of the "travelling trading post," i.e. the (often rapid) movement of trading posts across the landscape, selecting the location for trading facilities in relation to tribal territory, and post architecture. My research shows that, while Native groups were at times shaped by the world-system, they also renegotiated their participation in the fur trade according to their own cultural logics through a process of active decision-making and compromise over time.

Moore-Jansen, Peer (Wichita State University) and James Simmerman (Wichita State University)

[286]

Integrating Archaeological, Biological, and Archival Data in Cultural Historical Interpretation of Historic Mortuary Contexts

The study of mortuary contexts in anthropology can contribute to a further understanding of human history. Materials of cultural and biological nature, and when available, archival and other historical records, can be essential to the reconstruction of the historic cemeteries and the reconstruction of the social behavior of their corresponding temporal and geographical, reference communities. This paper discusses biological, material and structural site data revered from a mid-17th to early 19th century cemetery (D-1) in Western Poland. This region has been politically and administratively unstable for centuries with consequences to

ethnic composition, economic stability, food security, and nutritional status. Although neither is evident in the skeletal record among the skeletal remains from D-1, nor verified historically, the conditions of health and general social behavior of the D-1 "reference" communities are addressed based on data obtained from historical demographic reconstruction and certain non-biological manifestations of material from the subsequent analysis of the 2008-2009 excavations of the site. Historical demographic profiles from vital records for selected reference populations using archival records preserved on microfilm are contrasted with paleodemographic profiles. The results demonstrate shortcomings to using profile reconstruction relying solely on standard osteological technique.

Moraes, Claude [15] see Neves, Eduardo

Morales, Pedro [17] see Casar, Isabel

Morales, Pedro (Pedro Morales Instituto de Geología UNAM), Edith Cienfuegos (Instituto de Geología, UNAM), Isabel Casar (Instituto de Física, UNAM), Linda R Manzanilla (Instituto de Investigaciones Antropológicas, UNAM) and Francisco Otero (Instituto de Geología, UNAM)

[17] *Geographic Origins and Immigration of the Teopancazco Population in the Context of the Ancient City of Teotihuacan México: Stable Oxygen Isotopic Evidence*

Identification of geographic origins and migratory patterns of the individuals buried in the Teopancazco neighborhood center of Teotihuacan were established using the isotopic composition of oxygen in the carbonates of the apatite of their teeth. Also the isotopic composition of oxygen of actual rainwater from the local site (Valley of México) was determined as well as rainwater from the geographic locations of sites located in corridors towards the Gulf Coast of Mexico, in which caravans from Teotihuacan stopped in their trip. The geographic origins of the individuals from Teopancazco and six other compounds and structures from Teotihuacan with isotopic analysis were divided into 10 different geographical provenience zones with corresponding altitudes from sea level to 4000 msl. Teopancazco has immigrants coming from 8 of the 10 geographic zones and 62% of its population has values in the local range for oxygen of carbonate δ¹⁸OVPDB from -8. to -6. ‰.

Morales, Reinaldo (University of Central Arkansas)

[18] *The Oldest Rock Art in the Americas?*

Debate over the earliest peopling of the Americas tends to resurface periodically as new lines of evidence appear. Recently, paintings at the site of Serrote da Bastiana (Serra da Capivara National Park, Brazil) have emerged as possible evidence of South American rock art as ancient as the famous cave art of Europe, more than 30,000 BP. Very different estimates for the age of this "Serra da Capivara style" rock art have been published, some estimates in disagreement by an order of magnitude. Using multiple lines of evidence and traditional art-historical methodology, this paper reconciles those differences with significant results. The analysis of paintings from 130 local sites indicates there are many "Serra da Capivara" styles. One of these sites, Baixão da Perna I, includes the oldest securely dated rock paintings in the Americas (at the cusp of the Holocene; c. 10,000 BP). Another Serra da Capivara "style" is represented at Serrote da Bastiana (at the cusp of the Formative; c. 3700 BP, millennia later than expected for this "style"). Effective style analysis -- with reasonable expectations of "style" -- can reconcile seemingly contradictory chronometric data and better inform our understanding of culture and its fickle connection to art.

Moran, Kimberlee (Forensic Outreach)

[135]

Chair

Morehouse, Jana (University of New Mexico) and Michael Graves (University of New Mexico)

[5] *Agriculture in North Kohala: Fields, Ditches, and Innovation*

Ancient Hawaiian farmers were highly skilled at using landscapes and natural water flow areas to maximize agricultural potential in taro fields. On the windward side of North Kohala, on the island of Hawai'i, these practices also appear to include modifying the land with ditches, or 'auwai, in order to link different field complexes over many kilometers. This poster presents recent finds from the Hawaiian Archaeological Research Project (HARP) 2012 field season, including two series of agricultural complexes that are linked through 'auwai from the mountains to the coast, covering not only a long distance, but also many different geographic landscapes. The maps were produced using GIS and LiDAR analyses, and include archaeological, historical, hydrological, and topographical data. Results show these connected complexes represent innovations of a highly organized social and political society, with ethnohistoric data to support these claims.

Moreland, Milton and Kimberly Kasper (Rhodes College)

[223] *Living "In High Cotton": Women Plantation Owners in Antebellum West Tennessee*

In six years of excavations on the 20,000 acre Ames land base in west Tennessee, we have developed a clearer picture of the socio-economic world of the antebellum south. With over twenty contiguous plantations in our excavation area, we have been able to compare specific characteristics of the material culture from large plantations (3,000+ acres) to small plantations (300 acres). One interesting factor has been the discovery that six of the twenty plantations were established or run by women during the height of cotton production and slavery in the region (1830-1860). We have now focused our attention on the settlement of Fanny Dickens, a woman of financial means who chose to establish a small plantation after the death of her husband, in distinction from the other five women who inherited the plantation from their deceased husbands. Within this paper, we explore the complexity involved in the social and economic "positionality" and daily practice of Dickens and also the other five widows at their respective plantations. This type of archaeological and historical analysis which involves peeling apart these unique gendered narratives hopes to gain a more nuanced understanding of the power and gender dynamics within highly masculinized and racialized spaces.

Morell-Hart, Shanti (College of William and Mary)

[103] *Ancient Pharmacopoeias of Northwestern Honduras*

The landscape of Southeastern Mesoamerica is marked by a wealth of plants with medicinal properties, while historic and ethnographic resources attest to the diverse spectrum of health care incorporating botanical elements. Residues in the archaeological record (seeds, phytoliths, and starch grains) reference a variety of potential activities, some of them therapeutic in nature. Looking at four ancient communities in Northwestern Honduras, I draw upon ethnobotanical and ethnobiological studies to infer medical practices indexed by botanical remains. Comparing these findings with prior investigations, I address the complications of dividing plants into limiting categories such as "food," "fuel" or "medicine." I consider the importance of the apothecary craft in past lifeways, as well as persistent traditions in medical practice.

[103]

Chair

Morello, Flavia [26] see Alfonso-Durruty, Marta

Morello Repetto, Flavia (Instituto de la Patagonia, Universidad de Magallanes)

[26]

Hunter Gatherers of Cerro Benitez, Southern Patagonia: Discussing Environmental Changes and Cultural Developments over 10,000 Years

This study assesses archaeological evidence regarding hunter-gatherer activities in Cerro Benitez, southern Patagonia, project FONDECYT N°1100822. This information is evaluated in relation to the archaeological record associated with the late glacial setting of the Pleistocene versus the Holocene epoch. In particular, two specific issues are considered. First we consider changes in hunter-gatherer and fauna interaction, including predation evidence from a 10,000 year span, as well as prey fluctuations – especially after the big herbivore extinctions during Pleistocene-Holocene transition. Second, we address the role of technological variations in lithic materials in relation to how humans adapted to fluctuating environments over time.

The results of the analysis of the anthropic component at Cueva del Medio and the few archaeological features of Cueva del Milodón are presented for the Pleistocene. This information is compared to Holocene archaeological data from: the Cerro Benitez locality (including the old and new records), Cueva del Medio (Holocene collection), Alero Pedro Cárdenas, Alero del Diablo, Dos Herraduras and Cueva Ciro.

[26]

Chair

Morgan, Christopher [28] see Barton, Loukas

Morgan, Christopher (University of Nevada, Reno), Loukas Barton (University of Pittsburgh), Robert Bettinger (University of California, Davis), Mingie Yi (Institute of Vertebrate Paleontology and Paleoanthropology) and Dongju Zhang (Lanzhou University)

[222]

Behavioral Evidence for the Arrival (or Inception) of Modern Human Behaviors in Northwestern China During the Late Pleistocene

Around 40 kya in northwestern China, multiple lines of evidence point towards significant behavioral changes that temporally correlate with other evidence suggesting the arrival of modern Homo sapiens in East Asia. On China's Western Loess Plateau, a longstanding Paleolithic core-flake technology becomes geared more towards the deliberate manufacture of usable flakes and settlement patterns shift to encompass more intensive use of a greater array of environments. Along the middle Yellow River, re-dating of Shuidongguo Locality 1 suggests the inception or arrival of a flat-faced core and blade technology ca. 41 kcal BP. Combined, these data suggest significant behavioral changes that are arguably consistent with the hypothesis that modern humans arrived in East Asia ca. 40 kya with a novel suite of behaviors that contrasted sharply with preceding indigenous ones. But evidence for blade technologies persisting from then until approximately 24 kcal BP, when true microblade technologies appear, is scant. Further, core-flake technology persists throughout the region through the Pleistocene, and broad spectrum settlement patterns revert to narrow spectrum ones during the Last Glacial Maximum, suggesting an alternative hypothesis that modern humans did not become well established in the region until the Last Glacial Maximum.

Morgan-Smith, Maggie (University of North Carolina at Chapel Hill)

[65]

Placing Abandonment: Investigating the Process of Detachment from Rancho Kiuic, Yucatán, México

Abandonment is both an experience and process of detaching oneself physically and emotionally from a landscape that is profoundly shaped by the abandoner's sense of place. To understand this complexity, we must move past conceptualizing place as a "target of attachment" (Rodman 1992:204), by exploring

the processes by which people detach. I suggest that the use of oral history, in concert with traditional household archaeological methods, allows us to more meaningfully explore the nexus of experiential and processual aspects of leaving place. In this paper, I explore the human experience of abandonment using examples from ongoing research at Rancho Kiuic, an 18th-20th century Yucatec Mayan landed estate, abandoned by its laboring population. Despite citing oppressive working conditions and marked inequality between themselves and the landowning family, the descendant population maintains a connection with their old community that calls assumptions about the finality of abandonment into question. Meaning attached to Rancho Kiuic in the present is colored by the memory and physical remains of past inequality, and by the abandoners' sense of place. These complex relationships impacted decisions to leave the community, produced the material manifestations of that detachment, and continue to shape the descendants' interactions with the landscape today.

Moriarty, James [135] see McAllister, Martin

Moriarty IV, James [135] see Griffel, David

Morin, Eugene (Trent University) and Ready Elspeth (Stanford University)

[96]

Why Transporting Bones? An Analysis of Anatomical Profiles from Pleistocene European Archaeofaunas

Most studies of Paleolithic faunal assemblages assume that body parts of ungulates were transported largely as a function of associated whole food value. Our paper tests this assumption in Europe by comparing 167 human-accumulated cervid, equid, large bovine, and caprine assemblages with several utility models focusing on whole food, dry meat, marrow and bone grease value. The results we obtained, which consider a wide spectrum of rockshelter/cave and open air assemblages dating from the Lower Paleolithic through the early Holocene, appear to refute the commonly-held view that skeletal parts were transported to sites mostly as a function of associated whole food utility. Instead, we found much stronger correlations in our comparisons with models focusing on unsaturated marrow. These results have important behavioral implications because they suggest that fat acquisition was a driving force underlying animal food procurement during the Pleistocene in Europe.

Morin, Jesse (University of British Columbia)

[137]

Near-Infrared (NIR) Spectrometry of Stone Celts Reveals Interaction Spheres in Pre-Contact British Columbia, Canada

Aside from one large scale obsidian sourcing study, there has been very limited research into broad patterns of trade and exchange in pre-contact British Columbia, Canada. This paper addresses that shortcoming by summarizing the results of mineralogical study of 1374 stone celts from more than 200 archaeological sites across British Columbia. These artifacts were an integral part of the woodworking toolkits of aboriginal peoples in this region from about 3500 BP to AD 1790. The mineralogy of these artifacts was determined using a portable near-infrared (NIR) spectrometer, and the resulting data mapped using GIS. The results of this study indicate that celts were exchanged primarily within six discrete regions, each approximately 200 km in diameter. These six regions each display a unique pattern of reliance on a particular raw material or suite of raw materials for making celts. Only in one case – on the Canadian Plateau – do celts appear to have been used in a primarily social role as prestige goods, rather than as functional tools. These results challenge the common assumption that cultures on the Northwest Coast had a greater emphasis on ranking and disparities of wealth compared to the adjacent Canadian Plateau.

Morisaki, Kazuki (Nara National Research Institute for Cultural Properties), Masami Izuho (Tokyo Metropolitan University) and Hiroyuki Sato (The University of Tokyo)

[28] *Human Reactions to the Environmental Change of the Pleistocene-Holocene Transition in the Japanese Archipelago.*

This presentation discusses human adaptive reactions to environmental change of the Pleistocene-Holocene transition (15-10 Ka BP) in the Japanese Archipelago, focusing on correlations between behavioral strategies and environmental change. Past chronological studies established by Jomon pottery typology and radiometric data help us to recognize regional differences of lithic technology during this transition. Since those studies, however, have focused on typological change of lithics and pottery, it is still unclear how humans reorganized their behavioral strategy to adapt the environmental change. Accordingly, this research aims to examine spatio-temporal change of human behavioral strategy reflected in lithic technological organization, and discusses history of human environmental adaptation during this transition, integrating the above behavioral study into recent studies on climatic, faunal, and floral changes.

Main topics are as follows. Lithic technology and behavioral strategy in Hokkaido was always different from those of Honshu and Kyushu throughout the terminal Pleistocene because their ecological settings were different. Lithic technology and behavioral strategy in Honshu and Kyushu rapidly changed at the warm period of the Late Glacial, while the course and pace of those changes varied. Lithic technology and behavioral strategy characteristics of the Jomon period did not appear until the onset of the Holocene.

Moritz, Ryan P. [35] see Whistler, Emily

Morley, Mike [76] see Stewart, Brian

Morley, Mike (Oxford Brookes University)

[76] *Later Pleistocene Paleoenvironments of Lesotho: River System Responses to Climatic Change and Implications for the Viability of Valley Floor Environments as Cultural Landscapes*

Our knowledge of Later Pleistocene palaeoenvironmental change in southern Africa is scant. There is a striking lack of terrestrial sequences from which to derive high-resolution palaeoclimatic data and model the response of geomorphological systems to climatic trends. This is especially true of the Kingdom of Lesotho, which is yielding a particularly rich and diverse archaeological resource set within a uniquely high-relief, mountainous landscape. Current geoarchaeological research in this region is focusing on the generation of palaeoenvironmental data from the analysis of alluvial sediments, valley-marginal colluvial-palaeosol sequences and fluvial geomorphological features. This research is beginning to elucidate river system and landscape response to climatic shifts, thus providing environmental and climatic context to the rich archaeological narrative emerging from this region. From an archaeological perspective, this work aims to address an important question that is often overlooked: how can reconstructing river system dynamics inform us about changes in valley floor environments, and what are the implications for Later Pleistocene hominin populations traversing and inhabiting these landscapes?

Morris, Matt [78] see Ringle, William

Morris, Annelise (University of California, Berkeley)

[99] *Excavating Our History: Public Archaeology in Rural Southern Illinois*

In the 18th and 19th century, many free people of color found their wellbeing increasingly threatened in the southern U.S., and as a

result began to make their way to the northern frontier. They came to Indiana territory in significant numbers; founding small towns, clearing farms, and building schools and churches. Though often not highly visible in contemporary historical accounts, generations later many of these places still exist. I was born into one such area, and my research focuses on the archaeological and documentary investigation of its history. In July of 2012 I, along with a team of experienced archaeologists, students, and community volunteers conducted excavations at a farmstead built in the early 19th century and occupied through the 1920's by my African-American ancestors. Some key research goals of this project are to make the area's pioneer history accessible to the larger community, and to enter the deep roots of the African-American community into the local historical consciousness. This paper will discuss the methodological implications of these goals, the advantages and pitfalls of occupying the positionality of archaeologist, stakeholder, and descendant, and finally the benefits and logistical issues associated with opening a field site to community volunteers.

[99] *Chair*

Morris, Ellen (Barnard College)

[134] *Oases as Desert Islands, as Devil's Islands, and as Isles of the Blessed*

If Aegean islands are defined as much by connectivity as by insularity, as Bernard Knapp suggests, the oases of Dakhleh and Kharga in Egypt may be argued to better conform to the stereotype of islandness than many actual islands. This paper will consider a number of parallels between Egypt's western oases and islands, comparisons engendered primarily by remoteness and boundedness. The peril of the journey out to Egypt's oases is archaeologically attested by camel bones (desert shipwrecks) and by makeshift shrines to those who perished along the way. This isolation resulted in many governments—the ancient Egyptian, the Roman, and the English, to name a few—employing the oases as places of banishment. Conversely, due to their same remoteness, the oases served at other times as safehavens for enemies of the state and bases for predatory raids. Like the islands encountered by Odysseus, Egypt's oases were often imagined to be inhabited by monstrous creatures, and gods and creeds banned elsewhere in Egypt thrived in the oases. Further, the oases enjoyed a hothouse environment in which, as Robert Carneiro's circumscription model might predict, march lords assumed powers that would never have been permitted in the Nile Valley.

Morris, Zoe (University of Western Ontario), Christine White (University of Western Ontario), Lisa Hodgetts (University of Western Ontario) and Fred Longstaffe (University of Western Ontario)

[263] *Stable Isotopic Comparison of Maize-Consumption by Wild Turkeys from Late Woodland Ontario Iroquoian vs. Western Basin Sites*

We compare stable isotopic evidence for purposeful feeding of wild turkeys by two Late Woodland groups: the agricultural Ontario Iroquoians and the semi-mobile, horticultural Western Basin peoples. According to the ecological literature, wild turkeys are unable to eat maize from stalks, but will consume it opportunistically from ground scatter. Since maize has a carbon isotopic composition distinctive from most other plants in the region, its consumption by wild turkeys can be tracked using such data for bone-collagen and bone-carbonate. Carbon and nitrogen isotopic results for turkey bone collagen also offer the opportunity to compare the plant-heavy adult diet to insect-heavy juvenile diet as a possible indicator of seasonal differences in maize field-access. Our results suggest that during the Late Woodland period, maize consumption increased among some adult and juvenile wild turkeys from Ontario Iroquoian sites. When combined with archaeological evidence of turkey burials and seasonal killing, the data support the purposeful feeding of wild turkeys. In contrast, no increase in maize consumption was noted for wild turkeys recovered from contemporary Western Basin sites despite the

recent record of heavy maize consumption determined for Western Basin humans.

Morrison, Alex (University of Hawaii, Manoa) and Melinda Allen (University of Auckland)

[27] *Did Climate Change Drive Polynesian Migrations and Island Colonization? Modeling Climate Effects on Marine Ecosystems and Human Resources*

While recent archaeological studies have led to revisions in the chronologies of numerous island archipelagos, and generated fruitful methodological debates, little research has focused on the underlying causes of population migrations. We address the question of how regional scale climate change, and its effects on marine ecosystems in particular, might have contributed to processes of migration and colonization.

Using life history data, contemporary marine survey reports, and archaeological information we begin by modeling the spatial and temporal distribution of select marine organisms. We then develop an Agent Based Model to examine how specific climate parameters might have affected the productivity and sustainability of a model marine ecosystem, using the "almost-atoll" of Aitutaki, Cook Islands as a case study. Known or hypothesized climate conditions in the central Polynesia region during the last millennium are modeled, including variability in ENSO, sea surface temperatures and the magnitude and periodicity of tropical storms. The effects of these parameters on marine organisms, both individually and ecologically, are investigated. Our findings are relevant to a variety of island settings, informing on the dynamics of climate-marine fisheries-cultural interactions and identifying "tipping points" which might have stimulated regional scale migrations.

[47] *Chair*

Morrison, Alex [27] see Rieth, Timothy

Morrison, Kathleen (University of Chicago)

[146] *The Hidden Foundations of European Colonial Expansion in South Asia: Swidden, Foraging, and Their Misrecognition*

European colonial expansion into South Asia was linked to trade and motivated, in part, by profit. Many goods of the east relied on the labor of marginalized and historically 'invisible' groups, including shifting cultivators and hunter-gatherers. Tropical forest commodities such as pepper, indigenous to tropical southwest coastal India, were both collected wild in upland forests and grown in intercropped swidden plots; thus, the 'king of the spices' was produced by peoples not directly controlled by or known to most traders. Early Modern expansion of pepper exports led to specialization by many 'commercial foragers' as well as new opportunities for small farmers. Later suppression of swidden reduced subsistence diversity and flexibility. Both foraging and swidden were represented as ancient, primitive practices by European observers and officials; prejudice continued in anthropological scholarship. In this paper, I highlight the role of long-fallow agricultural systems in the spice trade, noting the close connections between foraging, farming, and trading. While there is growing recognition that foraging was sometimes adopted as a specialist profession, swidden farming continues to be seen as an archaic 'remnant' of the deep past, a notion at odds with the historical record of economic flexibility and diversity in this region.

[245] *Discussant*

Morrow, Juliet (Arkansas Archeological Survey), Patti Wright (University of Missouri-St. Louis), Robert Taylor (Arkansas Archeological Society) and Robert Scott (Arkansas Archeological Survey)

[54] *Mississippian Occupations of the Western Lowlands of Arkansas, circa A.D. 800-1300*

We present our interpretations of ceramic and lithic technologies and plant and animal use among different societies who lived in year round villages in the Western Lowlands of northeastern Arkansas. Three villages are on the Cache River: Bruce Catt (3CY91), Buffalo Head Slough (3GE6), and Kreb's Place (3CG453), and one village is at the headwaters of Village Creek: the Jarrett site (3RA95). Multiple ethnic groups living in the Western Lowlands during the early Mississippian period (A.D. 800-900) appear to have been influenced by expansion of people from southeast Missouri based on the presence of Varney (red filmed) pottery. The distribution of this early, red-filmed, shell-tempered pottery occurs primarily throughout the Mississippi River corridor, and the Western Lowlands lie at the western fringe of the Varney "heartland." A site-unit intrusion from Cahokia which occurred around A.D. 1100, the Cherry Valley phase (Perino 1959, Morse and Morse 1983), seems to have little influenced societies in the Western Lowlands; however, a slightly later site-unit intrusion from southeast Missouri related to the Powers Phase (Price 1978) is evident at the Jarrett site (3RA95) around A.D. 1250-1300. Much of the Western Lowlands is suddenly abandoned around A.D. 1350. Possibilities for abandonment are discussed.

[142] *Chair*

Morrow, Juliet [142] see Stuckey, Sarah

Morton, Shawn (University of Calgary)

[109] *Polity Development during the Late/Terminal Classic as Attested in Subterranean Site Contexts of the Caves Branch and Roaring Creek Valleys of Belize, C.A.*

Over the past five years, archaeology's understanding of the Caves Branch and Roaring Creek Valleys of Central Belize has changed drastically. The view of political organization has shifted from that of a peripheral, if significant, area focused around a number of small to medium-sized nucleated centers, to a recognition of the area containing one of central Belize's largest and most complex prehistoric polities fluorescing during the unsettled early years of the Classic Maya "Collapse" (ca. 750 CE). Our understanding of these events, and the processes driving them, are informed in no small part by findings in the caves, sinkholes, and rockshelters of the region. This paper presents the contribution of my ongoing doctoral research to the broader exploration of archaeological resources (both surface and subterranean) of the region.

Moses, Sharon (Coastal Carolina University)

[127] *Slavery, Syncretized Rituals, and Repurposed Objects: Native American and African Slaves in South Carolina Lowcountry*

Africans imported to South Carolina and Native American captives taken from within the region were sold as slaves during the Colonial settlement period in the South Carolina Lowcountry during the 17th and early 18th centuries. Evidence suggests these slave populations repurposed European materials to suite their own cultural identities in defiance of their slavehood, and shared sacred concepts, creating syncretized practices and objects. This paper will discuss excavations at the Hume Plantation on Cat Island, South Carolina and evidence of syncretization in ritual deposits and repurposed material culture.

Moss, Patrick [2] see Ulm, Sean

Moss, Madonna (University of Oregon)

[167] *Obsidian in Southeast Alaska and British Columbia: Travel, Trade, and Exchange, or Geochemical Overlap?*
 Obsidian artifacts from archaeological sites in the Alexander Archipelago of southeast Alaska have been used as evidence for exchange systems across the Northern Northwest Coast dating to >7000 BP. Obsidian artifacts have been assigned to sources on Suemez Island in the outer archipelago, or to sources on Mount Edziza in interior British Columbia, based on trace element geochemistry. The spatial distribution of different obsidians has important implications for understanding the early occupants of the Northwest Coast, their maritime mobility and social relationships, both along the coast and in the interior. Differences in the geochemical signatures of obsidian artifacts were inferred to indicate early Holocene travel or trade/exchange across hundreds of kilometers. The logistics of travel to source areas and the colors of obsidian in artifacts and sources are also assessed. We review the geochemical data to evaluate whether Suemez and Edziza sources have been reliably distinguished. Previous analyses and new data show that obsidian from Aguada Cove (Suemez), and from Mount Edziza are indistinguishable, and the obsidian from Cape Felix (Suemez), has a geochemical signature different from Aguada and Edziza. Obsidian artifacts previously assigned to Edziza sources may alternatively have been sourced at Aguada Cove. Previous archaeological interpretations require revision.

[35] *Discussant*

Most, Rachel [257] see Lerner, Shereen

Motsinger, Thomas [123] see Thompson, Kevin

Mountain, Rebecca (University of Arizona, Arizona State Museum)

[37] *Assessing the Relationship between Antemortem Tooth Loss and Osteoporosis among the Early Farmers of the Sonoran Desert*

Previous analyses of skeletal samples from the Early Agricultural period (c. 2100 B.C.-A.D. 50) in the southwest United States and northwest Mexico have documented significant differences in the rate of antemortem tooth loss (AMTL) between males and females. One possible cause of the increased AMTL in females is osteoporosis and the associated loss of mineral density in the alveolar bone. A number of archaeological studies have successfully used dual-energy X-ray absorptiometry (DEXA) to measure bone mineral density in dry bone. This method, however, has thus far only been applied to the postcranial skeleton. Approximately 20 skeletons from several Early Agricultural period sites in Southern Arizona were examined in this study. The goals of the study were twofold. The first was to determine the efficacy of DEXA in measuring mandibular bone density. The second was to assess the relationships between postcranial bone density, alveolar bone density, and antemortem tooth loss. The results of this study not only elucidate different contributing factors to tooth loss in Early Agricultural period populations, but also support a new method for evaluating a potential cause of AMTL that is widely applicable in archaeological specimens.

Mountjoy, Joesph B. [38] see Rhodes, Jill

Moussa, Nour, Karen Mooder and Fiona Bamforth

[77] *A Comparison between Two Late Neolithic-Early Bronze Age Cemeteries Ust'-Ida and Kurma XI through The Analysis of mtDNA*
 Lake Baikal area was home to two temporally distinct populations, the Kitoi (Early Neolithic, EN) and the Serovo-Glazkovo (Late Neolithic- Early Bronze Age, LN-EBA). The project seeks to reconstruct the lifestyle of the hunter-gatherers inhabited the area.

Several cemeteries have been excavated. Maternally inherited mtDNA from Kurma XI (LN-EBA) samples, not previously examined, was compared to another previously analyzed LN-EBA cemetery (Ust'-Ida). DNA analysis from Kurma XI burials will strengthen our analysis of the genetics of LN-EBA populations, as Ust'-Ida is the only LN-EBA cemetery examined to date.

26 Kurma XI teeth samples were cut using a sterile saw and their roots were soaked in bleach, rinsed with HPLC water and UV irradiated. After crushing the whole root, DNA was extracted. mtDNA was amplified and sequenced.

Results obtained previously from mtDNA analysis of 40 Ust'-Ida bone samples, revealed that the predominant haplogroups are A, C, D, F and G2a. Kurma XI samples have also haplogroups F and D. Haplogroup Z is a novel haplogroup in the Kurma XI population of the region.

The presence of haplogroup Z in Kurma XI and not in Ust'-Ida populations might indicate different female migration patterns around the area of Lake Baikal during LN-EBA.

Moy, Rachel (UCLA)

[129] *Travelling the Fayum: Agricultural Landscape and Economy in the Greco-Roman Period*

From the time of the Middle Kingdom, and again in the early Ptolemaic and Roman Periods, the Fayum was a homogenous agricultural landscape, characterized by regular patterns of canals, irrigation ditches, plotted fields, and roads designed for agricultural exploitation and transport. This paper examines how movement of people, goods, and agricultural produce functioned and changed in the Greco-Roman period. A study of Greco-Roman settlement, field, and road patterns is compared to a wealth of papyrological material that has come out of the Fayum. Many of these papyri contain correspondence between periphery and centers, discussing the management and economics of the region through contracts and letters. Rather than solely focusing on the content of these documents, this paper tracks their movements. Through examination of satellite imagery, least cost path analysis, and selective ground survey, many ancient routes can be reconstructed. These reconstructed maps allow closer examination of the existing agricultural trade network and what types of transportation were most likely exploited. It takes an in-depth look at ground versus water transport and explains how crops moved from farm to market.

Moyer, Teresa (National Park Service)

[198] *Youth, Community Partnerships, and the Urban Archeology Corps*

The National Park Service coordinated the Urban Archeology Corps with Groundwork Anacostia River DC to experiment with archeology as a way for youth to explore the urban environment and the park units therein. Learn about the program, the lessons learned, and view the participants' messages to the NPS about its management of the park and communication with the community.

Moyes, Holley [36] see Robinson, Mark

Moyes, PHD, Holley [109] see Nation, Humberto

Mraz, Veronica (University of Tulsa)

[278] *An Examination of the Plains Woodland and Plains Village Periods in North Central/Eastern Oklahoma through Lithic Assemblage Comparisons*

This report will involve a study of late prehistoric (Plains Woodland and Plains Village) sites within north central/eastern Oklahoma within the eastern Arkansas and west Verdigris river basins. This study will compare the cultural historic framework of this region, in an effort to understand the differences in material cultural signatures and land use strategies in a poorly understood area.

The data sets for this research are derived from primary studies as well as limited site report distributions largely from archaeological projects funded from the Army Corps of Engineers Tulsa division.

Mt. Joy, Kristen (Texas Army National Guard), Heidi Fuller (Texas Army National Guard), Jimmy Arterberry (Comanche Nation) and Holly Houghten (Mescalero Apache Tribe)
[281] *Survey without Shovels: Rethinking Cultural Inventories with Tribal Nations*

Archaeological inventories are standard fare for agencies such as the Texas Military Forces. However, these are limited in scope to identifying individual artifacts and features and do not accurately capture the entire cultural landscape. At the request of tribal partners, Texas Military Forces initiated an inventory to identify traditional cultural properties on their lands. This paper looks at the progress of the first project at Camp Bowie, Brownwood, Texas. It then discusses the challenges faced and lessons learned in working outside the standard archaeological methods and techniques to build a better understanding of the history of the lands managed by the Texas Military Forces.

Mudar, Karen (Archeology Program)

[30] *Henry T Wright: His Student Legacy, Service to the Field, and Contributions Beyond Academia*

Henry Wright's important contributions to the understanding of complex social organization have influenced archeological theory for 45+ years. His research spans the world, from investigations of early state formation in the Near East, Madagascar, and China to Paleoindian settlement and Archaic adaptations in North America. Equally important are the contributions that Wright has made through mentoring students, promoting public and amateur archeology, and through professional service. This paper examines Wright's continuing influence on archeology through his many students and through his work to promote archeological research through numerous venues.

Mulhern, Dawn (Fort Lewis College) and Mona Charles (Fort Lewis College)

[16] *Trauma Patterns in a Basketmaker II Population from Durango, Colorado*

The Eastern Basketmakers are known primarily from three sites in Durango, Colorado. Recent analysis and compilation of skeletal data from two of these sites has resulted in the most comprehensive look at health patterns in this population to date. The purpose of this study is to assess cranial and postcranial trauma patterns in the Eastern Basketmaker population (750 B.C.-A.D. 500) from Durango. Data collected for the human skeletal remains from the Basketmaker II sites of Darkmold and the Falls Creek Rock Shelters were evaluated for patterns of trauma by age and sex. Comparisons by sex show a higher frequency of cranial trauma in females and higher frequency of postcranial trauma in males. Subadults did not show any evidence of trauma. Results were also compared to a Pueblo I sample from the Durango area (A.D. 700-900); overall frequencies of cranial and postcranial trauma are consistent over time, although incidents of perimortem trauma are more frequent in the later time period and also affect subadults, implying changes in the types of interactions in prehistoric Durango area populations over time. Regional comparisons will also be discussed.

Mulhern, Dawn [16] see Charles, Mona

Müller, Noémi (NCSR Demokritos), Maria Dikomitou-Eliadou (University of Cyprus) and Vassilis Kilikoglou (NCSR Demokritos)

[178] *Calcite Tempering and Thermal Properties Of Ceramic Cooking Ware: The Case of Prehistoric Marki Alonia in Cyprus*

The notion of the beneficial effect of calcite temper on the thermal shock resistance of ancient cooking ware appears to be embraced

by many archaeologists and is frequently used to explain the particular manufacturing practice. The effect of calcite temper on a ceramic vessel's affordances has been widely discussed, explanations are, however, almost exclusively based on theoretical considerations, and contradicting statements are reached using different material models. When a recent study on utilitarian pottery from prehistoric Marki Alonia, Cyprus, revealed the synchronous use of imported cooking ware containing calcitic temper and locally produced vessels, made with a volcanic fabric, it was felt necessary to embark on an experimental investigation to overcome ambiguities inherent in the theoretical models, commonly employed to assess the thermal properties of such ceramics. While not per se explaining technological variation, an understanding of the influence of manufacturing parameters on material properties can provide the baseline when considering technological choices in utilitarian ceramics. Results obtained on experimental briquettes will be presented, outlining the influence of calcitic temper on thermal shock resistance and thermal conductivity. Beyond providing a baseline for considerations regarding consumption practices in prehistoric Cyprus, the results are applicable to calcite-tempered ancient cooking ware more generally.

Müller, Noémi [288] see Day, Peter

Mullins, Daniel [128] see Jolie, Ruth

Mulrooney, Mara (University of Auckland) and Simon Bickler (Bickler Consultants Ltd.)

[27] *Radiocarbon Chronologies at the Margins of East Polynesia*

Radiocarbon dates are fundamental to archaeological interpretations of East Polynesian prehistory. Despite a growing corpus of radiocarbon dates, debate persists regarding the interpretation of these data. We assess the latest radiocarbon dates from Aotearoa/New Zealand, the Hawaiian Islands and Rapa Nui (Easter Island) to examine how archaeological sampling and analyses are used to construct models of earliest settlement, palaeodemography, and cultural dynamics at the fringes of East Polynesia. Academic research and cultural resource management have rapidly increased the number of dates available for these island sequences in recent years. We explore the spatial distribution of dates in these contexts and compare models of Polynesian settlement on both the large and small islands at the apexes of the Polynesian Triangle.

Munns, Anna (University of Minnesota)

[108] *Ychsma Shells: A Malacological Analysis at Panquima*

The Inka influence on the Ychsma inhabitants of Panquima can be observed by noting variations in the malacological remains, and this presentation will convey the significance of the malacological data recovered from the site during the 2012 excavation season. The analysis of the malacological remains, conducted by speciation, determining minimum number of individuals, and weighing, demonstrates fundamental differences between the site's religious and domestic sectors as well as disparity between the Ychsma A and Ychsma B phases of occupation. The contextual locations of the recovered malacological materials, such as funerary contexts and middens, and the presence of lomas snails and non-local species such as Spondylus further explain the social and economic interactions which occurred during the site's occupation. When compared to other sites along the Peruvian coast, Panquima demonstrates a unique assemblage of recovered shell species, which emphasizes its importance in pre-colonial studies of Peruvian archaeology.

Munoz, Cynthia [41] see Mauldin, Raymond

Munoz, Cynthia (University of Texas at San Antonio) and Raymond Mauldin (University of Texas at San Antonio)
[281] *Deep Sands, Dense Sites, and Cool Water: Exploring Prehistoric Site Distributions on a Texas Army National Guard Facility using GIS*

Camp Swift, an 11,500-acre training facility, is one of eight installations maintained by the Army National Guard in Texas that contain archaeological sites. Over the past four decades, Camp Swift has been surveyed by various investigators resulting in the documentation of 306 sites (214 prehistoric and 136 historic components) that date from the Paleoindian period to the early 1940s. Using ArcGIS, we overlay this archaeological site data on georeferenced soil and hydrological maps to study the distribution and relationship of sites to these landscape features to determine if site distribution was a function of behavior or of geomorphic processes of exposure. We document that, contrary to our initial expectations, prehistoric site components are underrepresented on shallow soils and overrepresented on deep soils. This pattern may be a function of past decisions regarding access to water, as areas adjacent to streams tend to have deep soils. However, when we control for distance to water, the geomorphic pattern is not significantly affected. Other factors, including modern decisions to focus survey on high probability areas, may result in an underrepresentation of site discoveries in shallow soil areas.

Munro, Natalie [201] see Olszewski, Deborah

Munro, Kimberly (Louisiana State University) and David Chicoine (Louisiana State University)
[236] *Grinding Stone and Plant Processing at Caylán: A GIS Study*

The site of Caylán, which measures 80 hectares in its monumental core, is a Late and Final Formative (800-1 BCE) center located 15km inland in the lower Nepeña Valley, coastal Ancash. Several hundred grinding stones were mapped using GPS in and around the site of Caylán during the summer of 2012. This poster presents the results of a spatial analysis conducted (using the Arc10 suite) on the three different categories of grinding stones, including: Manos, Batanes, and Chungos. Stone material, form, size, and location as well as spatial clustering of the stones are analyzed to determine plant processing, ritual use, and domestic areas of the site. We pay particular attention to the architectural and spatial contexts associated with the use and discard of the stone tools, and their meanings to understand urban production and consumption during the Early Horizon.

Munro-Stasiuk, Mandy [125] see Manahan, T.

Munschauer, Lyman [186] see Bailey, David

Munson, Jessica (Simon Fraser University)
[171] *Social and Material Transformations in an Early Maya Community: Changing Views from Caobal, Petén, Guatemala*

Settlement expansion and major social transformations during the Preclassic period led to significant changes in the organization of lowland Maya society. This pattern is exemplified by changes in the form of large terraced platforms as well as by changes in ritual practices associated with residential and ceremonial structures. Against this backdrop, this paper presents recent data from the site of Caobal, a minor center with ceremonial architecture located near the site of Ceibal in the Pasión region. Multivariate clustering techniques were applied to data from multi-layered stratified units to infer synchronous episodes of construction throughout Caobal's 1600-year occupation history. This detailed reconstruction demonstrates continuities in settlement layout and significant changes in the architectural forms and materials used to construct monumental buildings. The transformation of Caobal from a rural

hamlet to minor ceremonial center is contextualized in terms of broader sociopolitical change during the Preclassic period. Minor temples like those at Caobal are interpreted as local nodes of community and religious interaction for households outside the core of major Maya centers.

Murakami, Tatsuya (University of South Florida)

[63] *State Administration and Political Dynamics at Teotihuacan: Early Classic Interaction Viewed from the Core*

While the presence of Teotihuacan-related material culture outside of the city has been taken as evidence for indirect administration, elite interaction or alliances, it is often difficult to discriminate these different models of interaction since they may result in similar material patterns. This paper examines changing political organization of the Teotihuacan state and explores different facets and scales of its interaction with other regions based on distributional analyses of non-local resources, such as lime, andesitic cut stone blocks, lapidary materials (e.g., greenstone), and other types of materials. Specifically, this study addresses how different social segments, including rulers, bureaucrats (both upper and lower echelons), intermediate elites, and commoners, sought to enhance their power and/or consolidate their social identity through external relations. The results indicate highly complex nature and multiple levels of interaction with other regions along with diachronic changes in the distribution of some materials.

[63] *Chair*

Murakami, Tatsuya [63] see Kabata, Shigeru

Muros, Vanessa (UCLA/Getty Conservation Program)

[253] *Analyzing Deteriorated Glass Using pXRF: A Preliminary Study of Vitreous Beads from the Late Bronze Age/Early Iron Age Tumulus of Lofkënd*

The availability of portable analytical instrumentation, such as portable x-ray fluorescence spectroscopy (pXRF), has allowed for more archaeometric research to be conducted on archaeological materials in the field, where artifacts can be analyzed in situ. The application of this technique to the study of ancient materials has been advantageous in that many more artifacts can be analyzed non-destructively without the need for sampling. Issues are often encountered, however, in the characterization of these objects due to the heterogeneity of the materials used, the method of manufacture or the alteration the artifacts underwent during burial.

This paper will describe the characterization of a group of vitreous beads excavated from the Late Bronze Age/Early Iron Age tumulus (14th-9th c. BC) of Lofkënd in Albania. The beads, which exhibited varying degrees of deterioration and corrosion, were analyzed using pXRF in order to identify the raw materials used. The factors considered in the creation of the analytical methodology will be presented. The challenges encountered in the interpretation of the results, and the importance of understanding the deterioration processes of archaeological materials when studying ancient artifacts will be discussed.

[253] *Chair*

Murphy, John, Mark Altaweel (University College, London), Lilian Alessa (University of Alaska) and Andrew Kliskey (University of Alaska)

[23] *Water Then and Water Now: Computational Approaches to Modeling Archaeological and Contemporary Water Management*

An important promise of the modeling approach in archaeology is generalizing from historically particular archaeological test-cases to dynamics and principles applicable across contexts and even into contemporary life. A long-running simulation project, the Hohokam

Water Management Simulation, has focused on the interactions among stakeholders along the large-scale irrigation works that extended from the Salt and Gila Rivers and that supported an extensive array of settlements for over a millennium. Recent work has continued the original simulation's intent to explore how alternative cooperative strategies might have led to resilient or vulnerable conditions for the canal systems' users. Two concurrent projects have recently been undertaken in which water management and resilience are central foci. One ethnographically based project echoes the HWM project by focusing on water management issues in small communities; the other mirrors the HWM even more closely by examining now another population exists today in central and southern Arizona, around the modern urban areas of Phoenix and Tucson. This paper will offer brief comments about current aspects of the HWM project, and discuss how the archaeological and contemporary modeling projects complement and inform one another in theoretical and methodological domains.

Murphy, Joanne (University of North Carolina Greensboro)

- [61] *Same, Same, but Different: Ritual in the Archaic States of Pylos and Mycenae*

This paper explores how two contemporary and culturally related archaic states, Pylos and Mycenae, manipulated ritual to communicate and create status. By exploring the evidence for rituals in these two Greek Bronze Age states I illustrate that although each was using ritual to express and confirm the elevated status and identities of their elites, both states used different types of ritual to achieve this. In the final periods of the palace's use, Pylos was becoming more architecturally similar to Mycenae yet it began to differ in its use and location of ritual. In Pylos as the state grew in size, status, and power it deemphasized its burial rituals in favor of rituals at the palace itself, such as feasting and sacrifices in its most elaborately decorated room. In contrast, Mycenae continued to invest large amounts of labor and wealth in its burials while also conducting large scale feasts at the palace and having areas at the palace reserved for ritual use, such as the cult center. This paper highlights the need for and the value of detailed contextual analysis of individual states in any society in order to understand the reasons behind their similarities and differences.

- [61] *Chair*

Murphy, Larry (ADIA) and Linda Scott Cummings (PaleoResearch Institute)

- [135] *Analytical Techniques for Organic Remains in Submerged Sites: Examples and Potential*

Submerged sites, both archaeological and forensic, possess potential for high degrees of preservation of organic remains. This paper discusses the nature and potential of this preservation and analytical technical tools and processes that can be applied to examine organic cultural remains from submerged contexts. Methods and concepts employed successfully in the archaeological investigation of submerged sites provide the basis for forensic applications.

- Murphy, Larry [135] see McAllister, Martin

Murray, Samantha (SWCA Environmental Consultants)

- [102] *The People of Plaza Church Cemetery (1822-1844): An Osteological Analysis of Los Angeles's First Cemetery*

In October of 2010, archaeological monitors encountered a portion of the old Plaza Church Cemetery that was thought to have been moved in 1844. As tree roots grew deep into the soil, as buildings were erected, and as blacktop was poured, the people of Plaza Church Cemetery had lain silently forgotten below the surface for over 150 years. This study presents the results of an osteological analysis of approximately 130 individuals excavated from the

Plaza Church Cemetery between 2010 and 2011. Despite extremely poor preservation of skeletal material and amidst the controversy between Native American groups and local agencies, the osteological analysis produced important data about a population living in 19th century Los Angeles as it transitioned from pueblo to city. Examination of the bones revealed a mixed group of hard working men, women and children with extremely modest burial practices and in overall poor health. The bones provide a glimpse of the people who built early Los Angeles and were then laid to rest in its first official cemetery.

Murray, Daithi [263] see Bunce, Michael

Murtha, Timothy [58] see French, Kirk

Mutin, Benjamin (Harvard University)

- [157] *Revisiting Contacts across the Hindu Kush in the Bronze Age*

Cultural contacts between the areas located south and north of the Hindu Kush during the Bronze Age have been demonstrated since the 1970s with the discovery of a site located in Tajikistan in the Zeravshan Valley that was occupied during the fourth and third millennia BC: Sarazm. Significant evidence for contacts with southern Turkmenistan and some elements that illustrate relationships with certain Bronze Age cultures of the Eurasian Steppe were also recovered at Sarazm.

Within the large area considered in this session, this paper intends to focus on the relationships established by the material cultures, especially the ceramics, between the regions of the Indo-Iranian borderlands and southeastern central Asia, and how they compare to the relationships observed between the Zeravshan Valley and the Eurasian Steppe. Some elements of discussion related to the chronology and mechanisms of contacts will be presented.

- [157] *Chair*

Myers, Sarah (Indiana University South Bend), Sarah Nixon (IU South Bend), Bryan Dull (IU South Bend) and James VanderVeen (IU South Bend)

- [269] *It Takes a Village to Excavate a House: Community Engagement in Archaeological Field Schools*

An archaeological field school is not often viewed as a public archaeology program. The members are university students whose primary goal is to learn the process of research design and the techniques of excavation. The field schools at Indiana University South Bend, however, have been conducted with the aim of involving the local communities in a sustained manner. We partner with area museums and historical societies, volunteers dig alongside students for the whole field season, the public and press are invited to visit, and the artifacts and information recovered are shared with the wider community through presentations and exhibits. The results of this effort are measured through interviews with field school participants and the associated institutions. Volunteers learned as much about general issues of stewardship and contributions made by archaeological research as they did specific site histories and the proper way to hold a trowel. In addition, the time students spent instructing the volunteers and visitors increased their own engagement in the discipline. By directly involving those who live and work in the area where the excavation is conducted, we are making public archaeology more personal.

Nadeau, Jaclyn (University at Albany)

- [155] *Research, Museum Collections, and Cultural Resource Management*

This study focuses on the relationship between emerging residential sedentism and technological change. It compares tools and cores, production stages, and technological efficiency from

multiple assemblages in eastern New York. It is designed for application to museum and cultural resource management collections where information crucial to interpretations of settlement and subsistence is often stored. Expressly emphasized is the importance of incorporating these underutilized resources into a formal research program. Materials are curated to allow for future research and contend with changing research paradigms. Using contemporary techniques of lithic analysis on curated materials thus ensures that preexisting models are still relevant.

[155] *Chair*

Nadel, Dani [162] see Power, Robert

Nagaoka, Tomohito [194] see Shimoda, Yasushi

Naito, Yuichi [138] see Yoneda, Minoru

Najjar, Mohammad [201] see Knabb, Kyle

Nakamura, Carolyn [32] see Agarwal, Sabrina

Nakassis, Dimitri (The University of Toronto)

[239] *Livin' in a New World: Elite Strategies during the Mycenaean Collapse*

This paper proposes a new view of inequality and how it was reproduced during the collapse of the Mycenaean states in Late Bronze Age Greece. It is commonly accepted that the collapse of the palaces ca. 1200 BCE engendered a deep-rooted change in the social order and a substantial decrease in social and economic inequality. It is thought that the elite disappeared along with the palaces, leaving local communities to their own devices, and resulting in the promotion of local leaders. I show that this explanation relies on a monolithic and bureaucratic model of the state that does not stand up to scrutiny. Recent work shows that palatial affairs were managed by a broad array of independent high-status individuals. Thus the palace is not so much a free-standing and closed system as a framework for interactions between heterogeneous agents. The collapse of the palatial system does have significant effects, but recent work on the archaeology of the 12th century BC suggests that these palatially-active elites did not simply vanish. They rather continued to assert their elevated status in ways that were largely unchanged. These strategies failed to account for their new socioeconomic environment, however, and were ultimately unsuccessful.

Nakazawa, Yuichi [147] see Iwase, Akira

Nakazawa, Yuichi (Hokkaido University), Akira Iwase (Meiji University), Masami Izuhō (Tokyo Metropolitan University), Toshiro Yamahara (Obihiro Centennial Museum) and Minoru Kitazawa (Obihiro Centennial Museum)

[208] *An Evaluation of Site Occupation Intensity: Hearth-Centered Spatial Organization at the Upper Paleolithic Open-Air Site of Kawanishi C, Hokkaido, Japan*

Prehistoric hunter-gatherers have often occupied flat open-air surface, while degree of site occupation intensity varied across occupational surface depending on how activities were organized. Given the perception that hearths have served as central nodes of human activities, we discuss the aspect of how Upper Paleolithic hunter-gatherers organized their activities around the hearths through an examination of intrasite variation in occupation intensity at the open-air site of Kawanishi C, southeastern Hokkaido, northern Japan. Followed by an identification of clusters of lithic artifacts with and without hearths, we scrutinize how burnt obsidian artifacts originally dropped into hearths scattered around

the locations of hearths in terms of artifact size-sorting. Natural and cultural size-sorting processes of burnt and non-burnt artifacts suggest that inferred occupation intensity and performed activities changed among hearth-centered areas. A quantitative comparison of burnt artifacts and refitted specimens among the clusters will further provide an implication of Upper Paleolithic hunter-gatherer's labor organization.

Naleimaile, Sean (University of Hawai'i-Manoa)

[203] *Discussant*

Nanavati, William (Washington State University), Rachel Sullivan (Washington State University), Nichole Bettencourt (Washington State University), Louis Fortin (Washington State University) and Melissa Goodman-Elgar (Washington State University)

[224] *Characterizing Tropical Anthrosols by Laser Diffraction Particle Size Analysis*

Particle size distribution or texture is a fundamental physical property used to deduce soil and sediment formation and other characteristics. Humans alter natural soils and sediments through additions, such as food refuse, and losses, such as tillage-induced erosion. We seek to characterize these anthropogenic patterns. However, traditional archaeological texture determinations by dry sieving and hydrometer or pipet methods are not universally effective. In our study of archaeological sediments from Bolivia, we found dry sieving considerably underestimated the fine fractions compared to wet sieving. Dispersion of tropical soils in sodium hexametaphosphate caused clay flocculation reducing the accuracy of pipet and hydrometer determinations.

We addressed these concerns by conducting a series of experiments using wet sieving and laser diffraction under different pretreatment methods. A major advantage of laser diffraction is high data resolution in 0.25 ϕ intervals. This allows comparison of particle size distribution curves that can be used to "fingerprint" the size classes impacted by human activity when compared with controls. Although all PSA methods have limitations, our comparative data show that wet sieving followed by a dispersion targeted to clay composition produces a replicable PSA method that better estimates sediment composition compared to standard treatments in these tropical soils.

Nash, Donna [61] see Williams, Patrick

Nash, Donna (UNCG)

[100] *The Haves and the Have-nots: Poverty in the Ancient Andes?*

At European contact the Andes lacked a developed market system but was home to the New World's largest polity, the Inka Empire. Even though there were stark differences in access to resources, because extraction was largely based on labor, social theorists argue that the empire was free from depredation. Ethnohistorical accounts praise the just administration of the Inka, however archaeology provides a check on these potentially polemical narratives. In this paper I examine household data, human remains, and labor demands from both the Inka and Wari empires to assess if these extractive polities subjected conquered groups to conditions of poverty.

Nation, Humberto and Holley Moyes, PHD

[109] *Social Implications of Spectrometric Techniques of Speleothem Sourcing from Belize.*

Archaeological investigations indicate that extensive political, economic, religious and military interactions existed between ancient Maya polities in Belize. One documented form of interaction is the breakage of speleothems from sacred caves and transport to political centers, which has become an increasingly

well-documented phenomenon (Brady et al. 1997). One way to elucidate the extent, meaning and significance of this practice is through chemically sourcing these cultural materials. With the exception of a few pilot studies, no substantial effort has been made in developing a methodology and database for that would help establish the provenance of lithic materials such as speleothems. This paper examines the ways in which spectrometric techniques are substantial changing our understanding of the social dynamics surrounding caves.

Naudinot, Nicolas (University of Nice - UMR 7264 CNRS)

[291]

Entering the Mountain Range: Altitude Settlements at the End of the Late-Glacial in the Italic Epigravettian Area

This paper aims to discuss the interpretation of dates/sites effectives by integrating several major taphonomic and socio-economic parameters that could affect the data and the way we interpret them. Among these parameters, using a techno-economic approach of lithic material, we specifically focus on the consequences of mobility strategies on these interpretations. In this perspective, we study the interaction between human societies and the altitude environments in the Italic recent Epigravettian techno-complex that spread between Bølling-Allerød and early Holocene. For the present paper we decide to focus on three research areas among this territory: 1. Venetian Pre-Alps; 2. Tuscany Appenin and 3. Liguro-Provençal Arc. Date/sites effectives vary consequently between the Veneto and Tuscany. How can we interpret these differences behind the taphonomic/research/politic bias? The techno-economic data from the Liguro-Provençal Arc allow us to discuss these variations. Our result show that even if the 14C/population relationship brings interesting information about populating tendency, these data cannot be only interpreted in term of demography but also in term of territory management.

[291]

Chair

Nauman, Alissa [120] see Hill, Katherine

Nauman, Alissa (Hamilton College) and Nathan Goodale (Hamilton College)

[127]

Exploring Expressions of Gendered Identity in Household and Community Organization at the Slocan Narrows Pithouse Village, Upper Columbia River Drainage, British Columbia, Canada

Studies examining the activities of women, men and children in the archaeological record have become gradually more common, yet have remained relatively absent in the Interior Pacific Northwest. In this paper we draw upon ethnographic literature and oral narrative to aid in the exploration of household and community organization at the Slocan Narrows Pithouse Village, a community located within the Upper Columbia River system dating c.a.3100-250 cal B.P., with the specific aim of examining aspects of identity and gendered behavior. Recent investigations have detailed a chronology of the site indicating four major occupations. Study of village layout at different slices in time offers insight into possible community dynamics, while material culture identified from excavations in a housepit dating to 1050 cal B.P. serves as a case study to examine the organization and use of space within a household. We utilize this data to assist in formulating an archaeological research strategy to aid further investigation of engendered activities at the Slocan Narrows Village site.

Naumann, Madeline [121] see Schubert, Ashley

Navarro Farr, Olivia [63] see Freidel, David

Navarro-Farr, Olivia (The College of Wooster), Griselda Perez (La Universidad de San Carlos), Damaris Menendez (Proyecto Arqueológico El Peru-Waka'), Francisco Castaneda (Proyecto Arqueológico El Peru-Waka') and Juan Carlos Perez (Proyecto Arqueológico El Peru-Waka')

[65]

Staying Power: Ritual Dynamics of Pre-Abandonment Political and Symbolic Agency at Classic Maya El Perú-Waka'

Macro-scale abandonment and collapse studies have provoked rich discussions about the dynamics of decline. They have also encouraged healthy skepticism about the seeming simplicity with which complex societies both rise and fall, as though subject to a kind of inevitable ebb and flow like the tide. Framing collapse in macro terms forces us to look at the intricacies of the micro-scale, revealing diverse processes of active social memory and notably deliberate responses which, in some instances, call into question the idea that decline is inevitable and passively responded to by a given populace. Indeed, fascinating new data from the main civic-ceremonial shrine at El Perú-Waka' reveals a striking emphasis on symbolic capital and reliance on corvée labor to execute a series of intentional symbolic "statements" and grand public ceremonies. It is suggested these acts were conducted to ensure continuity and the maintenance of balance in the midst of the dissolution of dynastic authority.

Nawrocki, Stephen [193] see Latham, Krista

Ndiema, Emmanuel [225] see Dillian, Carolyn

Nealis, Stuart [40] see Killoran, Peter

Nedelcheva, Petranka and Ivan Gatssov

[90]

Bullet Core Technology at South Marmara Region Seventh–Sixth Millennia B.C.

This paper deals with the main technological and typological characteristics of the Neolithic and Chalcolithic bullet core technology in the areas of South and East of Marmara and Northern Aegean shore. This technology spread in Northwestern Anatolia during the 7-6 mill BC and has been recorded in the lithic assemblages at different settlements such as Barçın Höyük, Ulucak, Menteşe, İlipinar, Fikirtepe, Pendik, etc. The fact that general technological and typological structure of the flint and obsidian assemblages didn't change in the space and time for around 1000 years predicts a generalized steady behavior and defined net of activities. As a whole the research reveals underlying uniformity concerning the lithic industry and the system of procurement, and documents evidence for common lithic traditions and in some degree similar environmental traits between plain and coastal settlements as well.

Neff, Linda (N Arizona University)

[48]

Getting Your Students to Read the Text in an Undergraduate Archaeology Classroom

Getting students to read the course-related texts in the archaeology undergraduate classroom is one of the biggest challenges facing instructors. Yet in order to teach undergraduate students how to think, they need to learn the language of the field. One way students can learn the basic language of archaeology is by reading about it. Yet undergraduate students have this amazing ability to avoid the reading assignments thereby thwarting instructor efforts to teach them how to think in well thought out critical thinking activities. While the summative mid-term and final exam is one way to assess a student's cognitive skills and mastery of the content, sometimes more frequent formative assessments offered at regular intervals, can help a student move toward the course goals. In addition, frequent assessments also help the instructor clarify and guide the students along the way; they help keep the students on track. In this presentation, I will share my

experiences using a variety of techniques to assess course-related texts in the undergraduate archaeology classroom (online and off). Using the misconception/preconception check, empty outlines, and muddiest point strategies in three different undergraduate course contexts, I will discuss how the course structure can lead to student success.

Neff, Hector [186] see Sweeney, Angelina

Neff, Ted (USU Archeological Services/Museum of Northern Arizona), Kenneth Cannon (USU Archeological Services), Molly Cannon (USU Archeological Services), William Eckerle (Western GeoArch Research) and Paul Santarone (Archeological Services)

[281] *Creative Mitigation in Action at Camp Williams, Utah: Archaeological Testing Results from Three Upland Sites*

While archaeological research in northern Utah is well established, only a relatively small percentage of it has focused on upland settings. The Utah National Guard and Utah State University Archeological Services recently completed an interdisciplinary assessment of three archaeological sites in upland contexts at Camp Williams in the West Canyon area. This research represented a creative approach to archaeological site mitigation. Work included geomorphic assessment, a magnetometer survey, and Optically Stimulated Luminescence (OSL) dating. The project area is notable for a high density of upland sites dating to the Archaic and Fremont time periods. The results presented in this paper shed some additional light on regional settlement in the uplands along Utah's Wasatch Front.

Negrino, Fabio [28] see Riel-Salvatore, Julien

Nehlich, Olaf [71] see Arndt, Ursula

Neitzel, Jill (University of Delaware)

[139] *Hair Styles and Identity in the U.S. Southwest*

This paper explores the issues of identity and interaction as evidenced by the hair styles and hair decorations worn by prehistoric Southwesterners. After first reviewing available historic period data, it analyzes two sets of archaeological evidence—material remains from throughout the Southwest and artistic depictions on Mimbres bowls, Casas Grandes effigy vessels, and Ancestral Puebloan kiva murals. These data document how hair styles and their decorations conveyed a myriad of identity messages as well as deeper layers of meaning. Some coiffures and accessories were restricted to particular groups, and some reflected broader connections. Within groups, women and men generally wore different styles both in daily life and on special occasions. Some accessories reinforced these gender messages, but this redundancy was secondary to their main purpose of marking social status and ceremonial roles. These additional messages varied, depending on the occasion and the complexity of the group. The most elaborate headdresses, and possibly some simpler decorations, were worn only as part of sacred rituals. Finally, some coiffures and hair ornaments linked people to their ancestral past and had embedded religious symbolism.

[139] *Chair*

Neller, Angela (Wanapum Heritage Center, Grant County PUD)

[246] *Moderator*

[246] *Discussant*

Nelson, Dan [7] see Kwak, Seungki

Nelson, Ben (Arizona State University)

[97] *Discussant*

Nelson, Amy (University of Oregon), Patrick O'Grady (University of Oregon) and Mike Rondeau (Rondeau Lithics Analysis)

[128] *A Survey of Clovis Technology in The Great Basin*

The Northern Great Basin has been a source of Clovis archaeology for many years and with the discovery of new sites throughout the Great Basin we are expanding our understanding of Clovis technology, people and culture more and more each day. The summer of 2012 I worked as a supervisor at the University of Oregon's Archaeology Field School located near Wagon Tire in Eastern Oregon in the Northern Great Basin, directed by Dr. Patrick O'Grady, a museum archaeologist at the Museum of Natural and Cultural History. Dr. O'Grady and I, along with Mike Rondeau, an expert in Paleoindian lithics, put together a survey of the area surrounding the rockshelter we were excavating for the field school. The goal of this survey was to gather as much information about the area as possible and to learn more about Clovis technology. The site has point types ranging from Rose-Springs points all the way to Fluted bifaces and associated technology such as overshot flakes and fluted tools and bifacial thinning flakes. We collected thousands of lithics and Mr. Rondeau has been working on the analysis of the lithics to give us a summary of the site's history and its Clovis component.

Nelson, Peter (UC Berkeley) and Sara Gonzalez (Carleton College)

[169] *Decolonizing the Ranks: Learning Field Methodology with and from Descendant Communities*

In this paper we will consider how the practice of decolonization impacts the values we foster in our roles as researchers, instructors, and mentors. Decolonization provides a process for thinking about the ways that our research can and does matter (and to whom). Particular attention will be given to the ways in which thinking about our accountability to both discipline and community changes how we train the next generation of archaeologists. We will explore one case, a UC Berkeley field school at Pinnacles National Monument, which was a collaborative effort between the National Parks Service, UC Berkeley, and the Amah Mutsun Band of Ohlone People. As a community-based project, Amah Mutsun community members were not only involved in planning and commenting on research design and methodology, but were also essential players in the operations of the field school itself (i.e., as instructors, project leaders, crew members, and even as cooks). This integrated involvement provided students from UC Berkeley and Vassar College with a unique learning landscape in which they had the opportunity to study Amah Mutsun history and heritage directly from and with the tribal community.

Nelson, Sarah (University of Denver)

[289] *Leadership in the Silla Kingdom of Ancient Korea and Relationships with the Yamato Kingdom in Ancient Japan*

This paper is inspired by a recent book which details the effect of 'immigrant' families from Korea into the Japanese islands at the time of the formation of the state in Yamato, based on documents. The author discusses silk weaving, goddesses, and cults in relation to families from Korea, detailing the strong place of women among royalty, in religious rites, and the importance of silk and silk worms. The author's uses the Hata clan from Goguryo for many of his examples. Other writings have noted influences from the Baekje elite, especially as the bringers of Buddhism to Japan – not merely as a religion, but also architecture, sculpture .and rituals. I will push this idea in another direction and compare the place of elite women in the hierarchies of both Silla and Yamato by exploring the archaeology of the Three Kingdoms period in Gyeongju and comparing it to sites in Japan, especially shrines.

[223] *Discussant*

Nelson, Margaret (Arizona State University)

[273] *Vulnerabilities to Food Securities: Can People Be Buffered from the Impact of Rare Climate Events?*

With careful attention to the relationship between climate, population levels, and ways of living, people can adjust to fluctuations in climate conditions within understood ranges. These are fluctuations that have been experienced or can be predicted from recent history and social memory. More challenging are the rare events – those outside of human experience and memory. Are there ways to think about such uncertainties that can help people build resilience to rare events? We use long-term histories of climate and social change to examine consequences of rare events under different vulnerability conditions in the Southwest US and North Atlantic Islands. We focus on rare climate events likely to impact the adequacy of food resources for provisioning people. We examine these dramatically different climates and social contexts as a way to understand how people experience rare climate shocks in the context of different kinds of vulnerabilities. Eight challenges to food security are defined, which we use to delimit constellations of vulnerability conditions that may limit resilience to the impact of a rare event and may offer resilience.

[273] *Chair*

Nelson, Shaun (Utah National Guard), John Crane (Utah State University/Utah National Guard) and Kenneth Cannon (USU Archeological Services)

[281] *A Creative Approach to Archaeological Site Mitigation at Camp Williams, Utah*

While archaeological data recovery is a common approach to mitigation, on-site excavation is not always an option. A recent range construction project at Camp Williams presented project planners and archaeologists with the challenge of mitigating impacts to a site that could not be accessed for data recovery due to significant concentrations of unexploded military ordnance. This paper will summarize the deliberate and thoughtful approach taken by the Utah National Guard and Utah State University archaeologists to develop a creative plan to ensure that impacts to the site are mitigated in a way that is meaningful and that contributes to the body of archaeological knowledge in the region.

Nesbitt, Jason (Tulane University)

[65] *After They've Gone: The Reinterpretation of Abandoned Initial and Early Horizon Monuments in the Moche Valley, Peru*

During the Initial Period (1700-800 cal .B.C) and middle Early Horizon (800-300 cal B.C.), the north coast of Peru was home to a well-developed and long-lasting tradition of monument building. Recent investigations at the Caballo Muerto Complex (Moche Valley) demonstrated that by the middle part of the Early Horizon, monument construction ceased and the site was abandoned for several centuries. However, excavations at several buildings at Caballo Muerto found abundant evidence that the site was reutilized for mortuary purposes and other types of ceremonial activities by the Moche (A.D. 100-800) and Chimu (~800/900-1470) cultures. In this paper, I discuss the significance of these remains and argue that the numerous Initial Period and Early Horizon monuments that dotted the landscape of the Moche Valley (and elsewhere) were significant and highly visible places that were reinterpreted by later cultures and may also have inspired subsequent developments in the region beginning in the early first millennium A.D.

Neubauer, Fernanda [50] see Schaefer, Michael

Neubauer, Fernanda (University of Wisconsin-Madison, CAPES Foundation)

[220] *Playing with Projectile Points: Umbu Childhood Flintknapping Imitation in Southern Brazil*

This study highlights how we can identify children in the archaeological record through the study of finished lithic products. Children are a significant component of most documented social groups and it is expected that they played a role in the creation of the archaeological record. In seeking to understand the many roles that children have played, I contrast lithic tools created by children with the products of more skilled flintknappers. As a case study I use Adelar Pilger site (RS-C-61), an Umbu hunter-gatherer rock shelter habitation site in Southern Brazil dated to 8,000 BP. By linking decisions related to raw material selection with the aesthetic and technological properties of projectile points, I have identified three types made by expert knappers, apprentices, and children. I demonstrate how these agents' differing final products represent distinct behaviors, intentions and choices. At the Pilger site, I suggest that children were producing projectile points around the fire as a form of play in imitation of the adults' knapping activities. Through their play, children were able to roughly imitate formal projectile point shapes but could not reproduce the tools in a three dimensional or technological sense.

Neusius, Sarah (Indiana University of PA), Laura Kaufman (Indiana University of PA) and Andrea Boon (Indiana University of PA)

[173] *Assessing Faunal Assemblage Comparability at the Johnston Site*

Since 2005, IUP archaeologists have been re-investigating the Johnston site, a large, Late Prehistoric village located near Blairsville, Pennsylvania, that has been considered the type site for the Johnston Phase of the Monongahela tradition of southwestern Pennsylvania. IUP excavations have produced a well-preserved faunal assemblage that can be compared with the faunal remains collected in the early 1950s by Don Dragoo of the Carnegie Museum. Flotation sampling by IUP also has generated a micro-assemblage of animal bone that provides other insights about Monongahela animal usage. Assessing these assemblages for comparability allows us to explore the ways in which sampling and recovery methods as well as differential preservation contribute to our data and interpretations. Key variables for assessing assemblage comparability include recovery method, context, fragmentation, and weight. Even though these assemblages are not entirely comparable, each contributes to the understanding of the use of animals by the inhabitants of this site, and interpreting the different faunal assemblages from the Johnston site promises to contribute to archaeological studies of the Monongahela tradition. Our studies show that it is important for zooarchaeologists to explore comparability in their analyses and make this kind of information available along with their interpretations.

Neusius, Phillip (Indiana University of PA), Sarah Neusius (Indiana University of PA), Beverly Chiarulli (Indiana University of PA) and Ben Ford (Indiana University of PA)

[257] *Teaching Heritage Values to Applied Archaeology Students*

The IUP MA in Applied Archaeology Program is specifically focused on providing its students with the skills necessary to become practicing archaeologists prepared to work as professionals in cultural resource management and related heritage fields. Two of our goals are to provide background in archaeological law and ethics and to expand students' understanding of archaeology's place in the broader arena of heritage management. Thus, we do not just teach archaeological theory, skills and knowledge. We offer a series of integrated courses including a required course in Archaeological Laws and Ethics, two required seminars in Cultural Resource Management as well as a variety of electives in topics such as Public Archaeology, Issues in Historic Preservation and Contemporary

Native Americans. Internships are also encouraged, as are related courses from other disciplines such as Public History and Environmental Planning. Related extracurricular activities are encouraged. We believe that combining these courses with more traditional archaeological training in a master's program is the best approach to educating our students. Although our program is only four years old, our initial graduates have had great success in finding employment, and have entered the workforce with many of the specialized skills needed by today's professional archaeologists.

Neusius, Sarah [257] see Neusius, Phillip

Neves, Eduardo (University of São Paulo), Michael Heckenberger (University of Florida) and Claude Moraes (Universidade Federal do Oeste do Pará)

[15] *Super Villages, Small Towns, Garden Cities: Understanding the Large Settlements of Late Precolumbian Amazonia*

Research done in the last few years brings mounting evidence for the presence of large settlements during the first and second millennia A.D. across the Amazon. Some of those settlements show the presence of highly structured and ordered spatial structures as well as long-term, century old, occupations that would qualify them as cities. However, a closer examination of the data shows that their wide range of forms and shapes defy their classification into received categories. This presentation brings the archaeological evidence to account for such diversity and proposes a different framework, based on the long-term symbolic and economic ties established by ancient Amazonian and the tropical environment, to account for the occupation and abandonment of those large settlements.

[60] *Discussant*

Newbold, Bradley (Washington State University)

[217] *Addressing Diet Variability via Bayesian Multi-Source Isotope Mixing Models*

The stable isotope signatures from agriculturalist groups covary with the degree of reliance on plant or animal protein, facilitating useful reconstruction of the diets of incipient farmers in the distant past and pinpointing local establishment of agriculture. In this study, stable carbon and nitrogen isotopes from bone collagen were used in concert with Bayesian multi-source mixing models to estimate proportional contributions of various food sources to the diets of Fremont-affiliated individuals of the eastern Great Basin and western Colorado Plateau. This source population (AD 400-1400) spans the beginnings of Fremont culture and associated agricultural practices, the peak of sociocultural and subsistence diversity, and subsequent demise and abandonment of farming. A novel freeware package, SIAR (Stable Isotope Analysis in R), is introduced and utilized as a more robust alternative to IsoSource and similar linear mixing model packages, as it is capable of both incorporating variation and uncertainty as well as accounting for grouping structure within the data.

Newman, Tiffany [87] see Villagran, Victor

Newsom, Lee A. [172] see Kistler, Logan

Newsome, Seth D. [88] see Etnier, Michael

Nez, Nanebah (Arizona State University / Tonto Nat. Forest)

[174] *What are the Moral Considerations of Engaging in Tribal Consultation?*

Anthropology in the Americas is besmirched with examples of academic researchers using Native American history and culture to build names and niches for themselves. Unfortunately these

case studies of abuse define the current animosity that exists on behalf of Native Americans towards anthropologists. So where does that leave us as agency representatives? Tribal entities see letters from agency liaisons and think, "What do they want now?" "What are the motives behind this request?" "How will this information be used?" "Who will benefit from this documentation?" In this paper I will explore the existing relationship between tribal entities and Federal Agencies. I will also explore personal experiences and strategies that I have employed as a Tribal Relations Specialist to overcome suspicion and build mutually respectful relationships with Tribes.

Nials, Fred (Desert Archaeology, Inc.; GeoArch)

[199] *The Role of Piping in Abandonment of Prehistoric Agricultural Sites and Interpretation of Site Features*

Piping (tunneling, subsidence, subsurface erosion) is a geological process described from almost every continent and climate regime, but is of particular importance in arid and semiarid regions such as the American Southwest. The role of piping in destruction of modern farmlands and development of badlands topography has long been recognized, but its import to prehistoric agriculture has been under-appreciated. Recent excavations in Arizona reveal the hazards of piping for irrigation farming and lead to new ideas regarding the formation and interpretation of some types of site features. The traditional association of piping and arroyo formation is not necessarily correct, and customary methods of excavation of pit features may not be adequate for identification of piping-related features. Many previously-identified "cultural" pits may be of natural origin. New evidence from floodplain agricultural sites in the Southwest suggests that piping may have been a significant factor in the abandonment of some agricultural sites. Criteria for recognition of piping-related features are reviewed, and suggested methods of excavation of some types of cultural features are presented.

[199] *Chair*

Nicewinter, Jeanette (Virginia Commonwealth University)

[178] *Geometric Communication on Cajamarca Ceramics*

With the advent of kaolin ceramics and a unique style of representation that includes naturalistic and geometric depictions, the prehistoric Cajamarca culture in the north highlands of Peru was archaeologically defined. Daniel G. Julien has deemed the hallmark style on Cajamarca ceramics a marker of Cajamarca ethnicity. However, the analysis of ceramics within terms of form and style is an abbreviated version of the complex communication intended to be understood by the viewer of the object. I argue that the geometric paintings prevalent on Cajamarca ceramics during the Late Intermediate Period, between 1000 and 1460 CE, at the site of Yanaorco represent a visual communication system that functioned within the code of Cajamarca culture and society. I will compare elements from representational and non-representational imagery on decorated Cajamarca ceramics to demonstrate that individual elements or signifiers worked within a communication system intended to employ ideas and concepts from the artist to the viewer. By reconstructing the visual communication system evident on Cajamarca ceramics, the ideological and artistic function of Cajamarca ceramics within prehistoric north highlands culture is better understood as a marker of identity and an implement for the formation of ethnicity.

Nicholas, George (Simon Fraser University)

[118] *Discussant*

Nicholas, Linda [133] see Feinman, Gary

Nichols, Deborah (Dartmouth College), Wesley Stoner (University of Missouri), Bridget Alex (Harvard University) and Destiny Crider (Luther College)

[288] *Altica and Early-Middle Formative Exchange in the Basin of Mexico: A Multi-Method Approach to Compositional Analysis*

Understanding Early and Middle Formative exchange networks in Mesoamerica is of broad interest. Recent analyses of Formative pottery from the Teotihuacan Valley identified a group of Zacatenco white ware pottery from the site of Altica that is compositionally distinct from any known central Mexican ceramics. Obsidian source data suggests Altica, 10 km from the Otumba source, was part of exchange networks with other settlements in the Basin and beyond. We discuss data from NAA, LA-ICP-MS, and petrographic thin section analyses of this distinct Zacatenco white ware group and compare them to ceramics and clay from Central Mexico and the Gulf Coast.

Nieva, Miguel [193] see Fondebrider, Luis

Nightingale, Sheila (City University of New York, Graduate Center), Alex Mackay (School of Archaeology and Anthropology, Australia), Jessica Thompson (School of Social Science, University of Queensland), Victor de Moor (Department of Archaeology, Leiden University, Leid) and Elizabeth Gomani-Chindebvu (Ministry of Tourism, Wildlife, and Culture, Lilong)

[76] *Variability in Middle Stone Age Stone Artifact Reduction Strategies and Raw Material Use in the Karonga District of Northern Malawi*

The variability of Middle Stone Age stone tool production has previously been demonstrated in the archaeological record of northern Malawi. However, evaluation of these assemblages in relation to those of more intensively studied parts of Africa has been minimal. This is in part because of a lack of chronological resolution and an analytical framework for typo-technological classification and comparison. From 2009 – 2012, archaeological survey and excavation of Middle Stone Age deposits in the Karonga region of Malawi has resulted in the recovery of artifacts from four different major river catchments. This dataset, which comprises worked ochre and over 40,000 stone artifacts from six sites and 21 test pits across the landscape, and detailed survey data of several hundred surface finds from the broader area, shows significant temporal and geographic variability of the artifactual record. This variability—evidenced in the differential use of raw materials and reduction strategies that vary in intensity of preparation and exploitation, both between sites and within layers at the same site—is of particular importance for understanding the adaptive responses of MSA hominins at times of inferred environmental change, and the behavioral trends that situate these hominins in relation to their contemporaries elsewhere in Africa.

Nigra, Benjamin (UCLA), Kevin Hill (UCLA), Michael Rosales (UCSB), Chloe Tolman (UCLA) and Camille Weinberg (UCLA)

[268] *An Analysis of Surface Ceramics from Cerro del Gentil, a Paracas Adobe Mound in the Chincha Valley, Peru*

Our 2012 research at the site of Cerro del Gentil (PV 57-59), an adobe platform mound in the Chincha Valley of the Peruvian south coast, revealed data suggesting that members of the Paracas regional community built and occupied the site during the Early Horizon. As a component of our long-term site management plan we systematically recovered and analyzed surface artifacts associated with looted pits and areas disturbed by earth-moving machinery. We focused on diagnostic ceramic sherds as one component of our recovery project. Our results suggest that occupants in the area immediately surrounding Cerro del Gentil utilized at least three distinct ceramic styles: Paracas, Topará, and later Carmen. Analysis indicates that both food preparation and consumption activities took place on site. Finally, recovery of

decorated ceramic panpipe fragments suggests that musical performance was an important component of the Carmen period occupation. Our study highlights the usefulness of cleaning looted contexts during early stage research as a method for gaining an preliminary, broad-picture perspective on site occupation and reuse, and as a compliment to concurrent data sets.

Nigst, Philip (University of Cambridge and Max-Planck-Institute for Evolutionary Anthropology), Larissa Koulakovska (Archaeological Museum, Institute of Archaeology, National Academy of Sciences of Ukraine), Vitaly Usik (Archaeological Museum, Institute of Archaeology, National Academy of Sciences of Ukraine), Freddy Damblon (Royal Belgian Institute of Natural Sciences) and Jean-Jacques Hublin (Department of Human Evolution, Max-Planck-Institute)

[207] *Exploring the Middle and Upper Paleolithic of Western Ukraine*

Neanderthal and modern human adaptations to various climatic conditions are a heavily debated issue in the archaeological and anthropological communities. In order to contribute to a better understanding of these adaptations during roughly MIS 5 to 2, we recently started an interdisciplinary research project in Western Ukraine. It was mainly selected for its rich archaeological record and the thick loess deposits. Since 2010 we are conducting surveys and test-excavations. Here we present first results of our survey in the Dniestr valley and of the excavations at Beregov (Transcarpathia). In the Dniestr valley we discovered many Paleolithic sites. These include one Middle Paleolithic site probably predating MIS 5e, mid Upper Paleolithic as well as late Upper Paleolithic sites. Excavations at Beregov provided a rich Proto-Aurignacian assemblage. First 14C dates and the lithic assemblage including Dufour subtype Dufour bladelets are presented. This is the first Proto-Aurignacian site in this region.

Nikita, Efthymia [172] see Radini, Anita

Nishida, Yastami [258] see Craig, Oliver

Nishida, Yastami (Niigata Museum of History), Hayley Saul (University of York), Carl Heron (University of Bradford) and Oliver Craig (University of York)

[258] *Hot Dishes in the Beginning of Jomon Period, Japan*

As one of the earliest pottery in Eurasia, Jomon pottery has gained a lot of interest since the middle of the last century. Compared to dating, usage analysis has been modest, until recent development of organic analysis techniques. Frequent carbonized residues and soot found on early pottery indicate their usage on fire, and this fact enabled direct AMS datings of the sherds. By taking a close look at the dating of the Incipient and Initial Jomon periods, one notices the difference in the numbers of results by pottery types. It does not reflect the difference in the amount of sherds unearthed. Actually there are some periods when residues are scarcely found. If the role of pottery did not change, there must have been changes in the ingredients or cooking methods. Our team has focused on carbonized residues on the incipient and the initial Jomon pottery from various parts of Japanese archipelago, and applied chemical as well as archaeobotanical analyses. The sampled sites include open sites, cave sites and shellmidden sites and dates range from ca. 13,000 cal B.C. to 5,500 cal B.C. To what degree can we establish the hot dishes that were cooked in the pots?

Nishimura, Masanari (Center for Research of Cultural Resource Kanazawa University)

[216] *Early Bronze Casting and Its Cultural Impact on the Prehistory of Northern Vietnam*

This paper argues that the earliest bronze metallurgy in northern Vietnam appeared with the early state of the Dong Dau period (ca. 3200-2900 B.P.). The Dai Trach site, located in the middle of the

Red River Plain, is a multi-component habitation site with Dong Dau and Dong Son cultural layers (3000 B.P. to 2200 B.P.). The 2001 excavation revealed two archaeological features of bronze casting, which suggests an intensive bronze production occurred during the Dong Dau period. Previous scholars have speculated about the possibility of bronze casting appearing during the preceding Phung Nguyen period. No Phung Nguyen site or site component has yielded bronze metallurgical evidence, however, and evidence from the Dai Trach site supports a model in which bronze casting was introduced in the early stage of Dong Dau period. This period witnessed a decline in settlement numbers, and an increase in site size along the major rivers. This change would be related to the shift from lithic to bronze raw materials for tool production. Parallels are also drawn between the earliest dated bronze technological tradition in Northeast Thailand and that of northern Vietnam.

Niven, Laura [68] see Bosch, Marjolein

Nixon, Sarah (Indiana University South Bend) and James VanderVeen (Indiana University South Bend)

[268] *Reproducing Ceramic Vessel Form to Reconstruct Usage: A Case Study of the Caribbean "Water" Bottle*

When considering the behavior of past people, the choices employed in the manufacture of artifacts are as important to consider as the usage, distribution, and symbolic meaning of those same materials. This is particularly true when the true use of an artifact remains in question. This poster examines the production processes employed in the creation of a specific vessel found throughout the pre-contact Caribbean. The bottle, known as a potiza, is often described as a water storage jar, but that usage is currently in debate. In an attempt to imitate the qualities found in potizas to better understand their function, vessels were created using various building techniques and firing styles and temperatures. These reproductions were subsequently tested with regards to predicted ceramic usage and breakage patterns observed in the archaeological record. As seen ethnographically around the world, ceramic vessel form is a function of cultural usage; as such, the experimental information of this study gives insight into the placement of the potiza in Taíno culture.

Nixon, Sarah [269] see Myers, Sarah

Nixon-Darcus, Laurie (Simon Fraser University) and A. Catherine D'Andrea (Simon Fraser University)

[250] *Making a Met'han: The Manufacturing of Grindingstones in Northern Ethiopia*

The manufacturing of grindingstones or saddle querns is a very ancient tradition found in both the Old and New World, and in some regions, the technology persists to the present-day. With the relatively recent introduction of diesel and electric flour mills, it is a rapidly disappearing technology. In northern Ethiopia, the production of grindingstones or met'han remains a living tradition, although this expertise is increasingly limited to an older generation. This paper presents the results of an ethnoarchaeological investigation of grindingstone production documented in the Gulo Makeda region of Eastern Tigrai. From raw material selection to final finishing, observations and data collection were informed by concepts of design theory and chaîne opératoire. Decisions made during the manufacturing process demonstrated a thorough understanding of the structural properties of stone, and design decisions affected the usability and longevity of the finished tool. Embedded in the manufacturing process are social implications for the people of this region.

Nobile, Juan [193] see Fondebrider, Luis

Noll, Christopher (Plateau Archaeological Investigations) and John Kannady (Plateau Archaeological Investigations)

[148]

A Geospatial Model of the Relationship between Chippable Stone Quarries and Workshop Locations in the Northwestern United States

Chipped stone reduction strategies rely on stone qualities that are necessary for controlled fracture. Stone with the necessary attributes occurs in source locations that are irregularly distributed and found in discrete localities. The presence of a high quality chippable stone source on the landscape is a major influence on population movements as it relates to the exploitation of that source. Secondary factors may influence the intensity of the exploitation of a raw material source. The dependent tasks involved in reducing stone into usable objective pieces require an investment of time that must be supported by the raw material source environment through available low-cost subsistence resources such as shellfish and ready-to-eat plants, and task dependent resources such as fuel for heat treatment fires. The availability of low cost subsistence resources and task dependent resources may have played a significant role in determining which stone sources were exploited prehistorically. This paper explores the secondary influences on raw material exploitation and provides some environmental parameters for geospatial modeling the location of lithic workshops.

Noonsuk, Wannasarn (Walailak University)

[104] *The Foundation of Greatness: The Early Development of the Tambralinga Kingdom in Peninsular Siam*

Located on the east coast of Peninsular Siam, an isthmian tract between the South China Sea and the Bay of Bengal, Tambralinga had the openness of an island to trade and cultural influences since the late centuries B.C.E. However, historians tend to talk about Tambralinga as if it emerged only in the early centuries of the second millennium C.E. when the kingdom reached its peak. During that time, according to the historical record, it sent a series of envoys to China, controlled the whole isthmus, sent a prince to rule Angkor, and even sent army across the ocean to occupy the northern part of Sri Lanka. It was the only Southeast Asian kingdom that could establish a vassal in South Asia. However, the early development of Tambralinga has largely been neglected by scholars. Therefore, this paper will examine the early material culture in the area of Tambralinga from the late centuries B.C.E. to the 11th century C.E. My archaeological fieldworks demonstrated that this area had the highest densities of Bronze Drums, early Vishnu images, lingas, Hindu shrines, and stone inscriptions in Peninsula Siam. Clusters of early historic sites on the GIS-based maps and the kingdom's cultural geography will be discussed.

Nordine, Kelsey [103] see Hageman, Jon

Norman, Garth (ARCON, Inc.)

[78] *Izapa, Mexico to Nazca, Peru by Sea--15 Degrees North and South Latitude SUN ZENITH Ancient Cultural Calendar Connection*

Izapa, Mexico's sophisticated design plan was completed in the 4th Century BC prior to initiating construction of mounds and monuments. The master plan incorporated geometric mandalas, standard measures, calendar observatory and precession measures in the temple center. This empirical data base provides a solid foundation for Izapa comparative studies. Izapa's 15 degree north latitude Zenith sun passage documents the sacred 260-day calendar. I traced Izapa's Anti-Zenith to 15 degrees south latitude at Nazca, Peru in search of the sacred 260-day calendar in the southern hemisphere. A Google Earth satellite survey reveals Izapa's full design plan reached Nazca by sea during the settlement of Cauachi around 200 BC. The full data is found in the Nazca lines dimensions and astronomical orientations and in the Cauachi temple geometric design with standard measures and astronomical orientations. This data illustrates long distance cultural contacts by sea and establishes a firm foundation for more open, serious trans-oceanic cultural contacts research.

Norman, Scotti (Vanderbilt University), Asa Cameron (Vanderbilt University), Carla Hernandez (Vanderbilt University) and Steven Werneke (Vanderbilt University)
[235] *Producing Colonial Place: GIS-based Spatial Network Analysis of a Planned Colonial Town in Highland Peru*

During the 1570s, Spanish policies in the Viceroyalty of Peru sought to instill a program of colonial dominance through mass resettlement to planned towns (*reducciones*). Little site-level research investigates how such colonial policies were instituted *in situ*, or how they were received by Andean communities. Previous research in the Colca Valley of highland Peru demonstrates that these policies were in part enacted through the modification of the built environment within preexisting sites, producing novel places that synthesized elements and practices from both indigenous and Spanish traditions. At Mawchu Llacta, a *reducción* in the Colca Valley, evidence suggests that the site layout was initially centered on a trapezoidal plaza from a major preexisting Inkaic center, while a second, rectangular plaza was subsequently elaborated. In this poster, spatial network analysis simulates patterns of access and movement between houses and these two plazas within the *reducción*. This approach illustrates how *reducción* resettlement was not an arbitrary imposition of foreign spatial practices, but instead was actually enacted through micro-scale processes of recycling and transformation of the built environment, which both reinforced and transformed indigenous spatial practices. These ambivalent processes of co-production in turn generated distinctly colonial-Andean modes of dwelling.

Normoyle, Jessica [182] see Richardson-Cline, Krista

Novic, Juliana (ASU School of Human Evolution and Social Change)
[229] *Social Mixing in the Neighborhoods of Aztec Period Calixtlahuaca, Mexico*

Social scientists have been interested in social clustering or segregation and social mixing for decades. Archaeologists have been slow to focus on these aspects of community. The social organization of a city can have profound effects on the type of community and political organization present there. I examine social clustering and social mixing along the lines of class, ritual, and consumer preferences in the twenty neighborhoods of Calixtlahuaca. The data and analysis show that Calixtlahuaca was a socially mixed city in many respects. House groups shared similarities in consumer preference of ceramics, but these preferences did not dictate where they chose to live. Elites and commoners lived side by side. However, neighborhood location did relate to access to or desire for certain ritual objects and sources of obsidian. These findings suggest that issues of social clustering and social mixing cannot be summarized with one measure. Many factors impact residential choice.

[229] *Chair*

Novotny, Anna (Arizona State University)

[256] *History and Genealogy among Ancient Maya Commoners of the Belize River Valley, Belize*
 Iconographic, archaeological, and ethnographic data indicate that lineage membership was a prime social structuring element in ancient Maya society. The extent to which this is true for commoners is not well understood. Scholars argue that ancestor veneration was a cultural institution that originated with commoners, however their means of communicating the importance of lineage in archaeologically recoverable materials were limited since they could not rely on hieroglyphs or iconography. The goal of this paper is to assess the extent to which leaders of three mid-level sites of the Belize River Valley, Belize, emphasized lineage membership using contextual and bioarchaeological data. I address the importance of lineage to mid-

level leaders of the Late Classic period (A.D. 500-900) by investigating the degree of biological relatedness through kinship analysis of individuals interred in eastern structures, interpreted as a location of lineage ancestors. The data are expected to demonstrate that commoners emphasized lineage, and thus valued their own history and connection to the past.

Novotny, Claire (University of North Carolina - Chapel Hill)

[256] *Households and Hinterlands: Synthesizing a Regional Chronology for the Toledo District of Southern Belize*

In the Toledo district of southern Belize, diachronic data established through ceramic typologies and AMS radiocarbon dates are currently refining our understanding of when and for how long the ancient Maya occupied monumental site centers. However, I argue that in order to synthesize a regional chronology for southern Belize, researchers need to evaluate archaeological residues from hinterland settlements. This paper reviews ongoing archaeological research at rural farming settlements surrounding Aguacate village in the Toledo district. Using archaeological reconnaissance, topographic mapping, and surface collections, I consider how the recorded sites fit into ceramic chronologies established at Lubaantun and refined at Nim Li Punit and Uxbenka. Additionally, I explore how spatial data expands our knowledge of diachronic settlement. Preliminary ceramic data from sites on Aguacate community land suggest that settlement may have occurred as early as the Early Classic period (A.D. 250-500), and extended through the Late Classic period (A.D. 500-900). Spatial data suggest that building houses on hilltops was consistent over time. Consideration of hinterland households, their chronology and spatial location, is key to a holistic understanding of the sociocultural processes that shaped ancient society in southern Belize.

Nowell, April [162] see Bisson, Michael

Nowell, April (Univ of Victoria-Dept of Anth) and Melanie Lee Chang (University of Oregon)

[217] *How to Make Stone Soup: Paleolithic Archaeology and the "Paleo Diet"*

Health and fitness books touting the benefits of eating a "Paleo diet" and following a "Paleo lifestyle" have proliferated greatly in recent years with more than 500 books and countless pre-packaged "Paleo" foods, Paleo shopping list apps and other products currently available to consumers. With titles such as NeanderThin, Primal Body, Primal Mind, and Cave Women Don't Get Fat: The Paleo Girl's Diet for Rapid Results, these books clearly resonate with a significant segment of the North American population. This paper explores the assumptions underlying various iterations of the "Paleo movement" and their relation to the archaeological and paleontological evidence for the health, diet and subsistence strategies of our hominin ancestors at different points in our evolution. By way of conclusion, this paper addresses why some people aspire to live a "Paleolithic life."

Noyes, Martha

[280] *Writing the Heavens on the Earth: Hawaiian Cultural Astronomy at Kūkaniloko*

Recent research at Kūkaniloko, an important site in central O'ahu best known as the piko (navel) of Hawai'i and a royal birthing site, shows that landscape features both within the view of Kūkaniloko and beyond view were named in such a way as to locate the rise and/or set of stars as and stations of the sun. This ordering of the landscape and stars served to mark events in the culture's cosmology, the structure of its celestial architecture, and at least one element of societal governance.

Nuevo Delaunay, Amalia [26] see Méndez Melgar, César

Nuevo Delaunay, Amalia (INAPL-Buenos Aires), Juan Bautista Belardi (UNPA- CONICET), Flavia Carballo Marina (UNPA) and Hernán De Angelis (CASIC- CONICET)

[26] *Contact, Disarticulation, and Continuity in Tehuelche Groups: Settlement Patterns and Technology in South Patagonia (Santa Cruz, Argentina)*

Archeological research in Patagonia has focused primarily on the study of hunter-gatherers prior to the contact with European settlers. However, if we consider regional peopling as part of a continuum that can be archeologically evaluated until recent - historical moments, this kind of research can provide meaningful insights for assessing settlement patterns and technological choices of a farther past. We study the archeological record attributed to Tehuelche groups already immersed in the social-economic context of the Argentinean state, yet these data are considered independent and complementary to that provided by the historical record. By studying settlement patterns and the use of technology in four different XIX-to-XX century sites of indigenous ancestry, we evaluate the variability of hunter-gatherers material responses as a consequence of European contact. We discuss the different responses and the resilience of the Tehuelche peoples towards European contact at the final stages of the disarticulation of a lifeway based on hunting and gathering. This paper may be useful for understanding the causes of change/continuity of other groups in the past.

Nydegger, Nick [281] see Fruhlinger, Jake

Oas, Sarah

[103] *Revisiting Bosumpra: Investigating Plant Use, Continuity, and Change in the Ghanaian Rainforest during the Late Stone Age*

The rockshelter of Bosumpra in southern Ghana is among the most important sites of the Late Stone Age (LSA) period in sub-Saharan West Africa. The rockshelter is one of the only known LSA forest occupation sites, and it has the longest known continuous occupation sequence in Ghana, spanning almost the entirety of the LSA (c. 10, 280-2550 BP). Scholars interested in West African subsistence practices have long hypothesized that Bosumpra might provide early evidence of tree-nut cultivation, as remains of oil palm (*Elaeis guineensis*) and incense tree (*Canarium schweinfurthii*) were recorded from earlier excavations at the rockshelter. This paper presents the results of my M.A. thesis, that focused on the macrobotanical analysis of the seeds, fruits, and wood charcoal remains from the most recent re-excavation at Bosumpra (2008-2010). I provide the first quantitative evaluation of tree-nut taxa use at the site, and document changes in preference between these taxa over time. I also describe the other plant materials recovered, including domesticated millet (*Pennisetum glaucum*) and cowpea (*Vicia unguiculata*), providing some of the first macrobotanical data about the emergence and spread of plant domesticates in the tropical forests of southern Ghana in the LSA.

OBoyle, Robert (University Of Montana), Alvin Windy Boy Sr. (Chippewa Cree Tribal Historic Preservation Officer) and Jason Brown (Heritage Preservation Office Content Management Sy)

[265] *The Good, the Bad, and the Federal Government: A Way forward with Tribal Consultation*

The Ojibwe and Ne-hi-yah-w people of the Rocky Boy's Indian Reservation have been working with federal agencies for years on consultation and the 106 process. The Chippewa Cree Cultural Resource Preservation Department has worked with varying degrees of success with federal agencies. Some of these partnerships have been great, demonstrating what can happen when tribes and federal officials work together, while some have shown the inadequacies and shortcomings of many federal

agencies in their level of tribal consultation. This poster is about solutions. The authors have developed an innovative web based solution where Government Agencies and Tribes can work together in the consultation process. A simple letter sent to the tribe has been found to be inadequate to fulfill the requirements under 36CFR800.2Bii. The Cultural Resource Preservation Department has a "forms" page on the cccrpd.com website where federal and state agencies can submit information to the Tribe for consultation and review. Because it is web based, all parties – no matter if they are in Box Elder, Montana or Bensenville, Illinois can access the information. All communication and information can be stored in a single easily accessible location.

O'Boyle, Robert C. [262] see Bello, Charles

O'Brien, Lauren (Southern Methodist University)

[16] *New Investigations of Pithouses in the Northern Taos Valley*

Recent archaeological investigations at several pithouse sites in the Northern Taos Valley have revealed new insights into this period. Research undertaken over the last 30 years has predominately focused on the southern half of the valley, leaving our knowledge of the northern half insufficient. Excavations over the past year have improved our understanding of the design and use of these structures, as well as on extramural areas and possible structures associated with them. This paper will show how this new data has modified our interpretations of what was occurring in the northern half of the Taos Valley, and possible who was occupying it.

O'Brien, Matthew (University of New Mexico)

[151] *Identifying Leadership for Communal Hunting Episodes at the Eden Farson Site*

It is commonly assumed that social status is invisible within hunter gatherer archaeology due to the absence of clear indicators of prestige among the material culture. In addition, defining individuals or individual households in often obscured by site formation processes. Ethnographic evidence indicates that most hunter gatherer societies possess some degree of inequality among individuals. These differences are associated with those individuals that possess a comparative advantage over others, which results in greater benefits for themselves or their family. Skewed returns are commonly mentioned in historical and contemporary accounts of communal hunting that require leadership for the organization of labor and policing of participants during the event. This presentation aims to address the issue of identifying leadership, or enhanced status, in archaeological assemblages through a combination of faunal and spatial analyses. The Eden Farson site, a communal pronghorn kill site in southwest Wyoming, provides an opportunity to address implications of leadership in an otherwise egalitarian society. In the analysis of the estimated 175 pronghorn dispersed among the 10 households at Eden Farson, evidence suggests that is possible to identify skewness, or preferential treatment, in the distribution of the proceeds from this communal hunting episode.

O'Brien, Michael [217] see Collard, Mark

Ochoa, Patricia [248] see Velazquez, Adrian

O'Connell, James [2] see Codding, Brian

O'Connor, Sue [7] see Bulbeck, David

O'Connor, John (University of Hawaii-Manoa)

[27] *Fishhook Variability in East Polynesia*

The colonization of the eastern Pacific islands has long been of interest to archaeologists given its relatively recent history and remoteness. The geographical isolation exemplified by the archipelagos of East Polynesia provides an ideal situation for the study of cultural development among descendants of an initial ancestral population. My study examines proximal endpoint line-attachment-devices (LAD) in prehistoric fishhook assemblages from East Polynesia to address questions of early colonization, migrations, and interaction. I build relational networks using artifact classes and compare these artifact trait networks to the geographical distributions of the analyzed assemblages. The relation of stylistic character states among assemblages maps cultural transmission lineages. From this analysis I explore the degree of cultural relatedness among various East Polynesian fishhook classes, their sharing in space and time, and consider some of the implications of colonization order and human migrations in East Polynesia. Sample size differences limit the analytic potential of this study, but point to areas for future research.

O'Connor, Sue (The Australian National University)

[167] *Pleistocene Maritime Societies in Island Southeast Asia*

Some time prior to 50,000 years ago modern humans left mainland Asia (Sunda) and began the first of a series of maritime voyages that was to culminate in the colonization of Sahul (Australia and New Guinea) by 50,000 B.P. The maritime technology implied by this accomplishment has raised many questions which cannot be addressed by the earliest sites in Sahul. Recent excavations in caves on the north coast of East Timor have recovered the world's oldest fish hooks together with an assemblage of fish bones, including many from pelagic species like tuna. This evidence dates back to 42,000 B.P. and shows that the people living in the islands to the north of Australia either arrived with, or rapidly acquired, considerable maritime skills and equipment. It seems likely that it was these skills that made the colonization of Australia possible at this early date. This paper explores the technological implications of the marine faunal assemblage and the role of the shell and osseous artifacts in the procurement of these resources.

Oda, Hirotaka [222] see Izuhō, Masami

ODay, Karen (University of Wisconsin-Eau Claire)

[19] *Inferring Identity of Gran Coclé Anthropomorphic Effigy Vessels ca. 550-1150 C.E.*

Polychrome ceramics form a major corpus of visual expression by the societies of the Gran Coclé region. Accordingly, consistent scholarly attention examines a wide range of issues. The region's ceramic chronology is firm. Spiritual, social, political, and economic roles of the vessels have been described. Ample interpretations of the zoomorphic and geometric iconography exist. Among this research, one data source is relatively overlooked: anthropomorphic effigy vessels. Admittedly, they comprise a smaller database than the thousands of plates, bowls, and jars and, in addition, the zoomorphic effigies are also more numerous. On the plus side, recent studies of effigies and figurines demonstrate that they form productive and unique data sets. As such, the effigy vessels potentially complement the excavated burials, which stand as the main data about the people of Gran Coclé. This presentation focuses discussion on the effigies' identity markers. A preliminary insight about gender follows: it is possible that the anthropomorphic effigy vessels are the first evidence of gender variance in Gran Coclé.

Odegaard, Nancy [139] see Santarelli, Brunella

Odess, Daniel (University of Alaska Museum)

[168] *Discussant*

O'Donnabhain, Barra (University College Cork, Ireland)

[209] *Americans Abroad: Providing Meaningful Archaeological and Cultural Experiences in an English-Speaking Destination*

Ireland has for long been a popular destination for US-based students seeking to study overseas. However, as the US government and institutions of higher education are pushing students to participate in programmes at non-traditional destinations, is the Irish experience still relevant or valid? This paper explores the reasons why Ireland became an attractive destination in the first place and critically evaluates the position of 'traditional' locations and their ability to compete with non-traditional venues and to recruit US students in the future. It will present the type of research experiences developed countries may offer to field school students and explore whether such experiences are sufficiently 'exotic'. It will examine the place of archaeology in general in the context of the desired outcome and intended goals of the Simon Study Abroad Act and will suggest that archaeology itself is non-traditional and offers students meaningful and transformative cultural experiences. In this context, the research location itself is of secondary relevance.

ODriscoll, Corey (University of Queensland) and Jessica Thompson (University of Queensland)

[263] *Zooarchaeological Evidence for Projectile Technology in the African Middle Stone Age*

The ability of Homo sapiens to kill prey at a distance is arguably one of the catalysts for our current ecological dominance. Despite the importance of projectile technology in human hunting strategies, there is no consensus on its origins. Many researchers have suggested it lies in the African Middle Stone Age (MSA) or Middle Paleolithic. However, evidence from the MSA is dependent on analysis of the stone points themselves. There is a growing body of research focusing on zooarchaeological projectile impact marks in European assemblages; however, comparable investigations are currently lacking for the MSA. The criteria for identifying projectile impact marks on bone are not standardized, and no large experimental studies exist that examine marks left by MSA points. Therefore, a clear analytical framework must be created through experimental samples. Using replica MSA prepared core points and Howiesons Poort segments – present during the southern African MSA – this paper defines the various forms of marks on bone caused by stone artifacts commonly considered to have been used as projectiles at this time. When applied to the archaeological record, these results suggest that the earliest direct evidence for hunting practices in southern African MSA deposits dates to ~90 ka.

Oechsner, Amy (U.S. Bureau of Land Management)

[91] *Challenges and Strategies: Managing the Old Spanish National Historic Trail in California*

In 1829, New Mexican trader Antonio Armijo blazed the Old Spanish Trail: first overland conduit of immigration and commerce to pierce Alta California and tie it to the east. Congress designated this significant byway a National Historic Trail in 2002, and assigned the Bureau of Land Management and National Park Service joint managers. In California, where the Trail crosses prodigious swaths of BLM land, BLM cultural resource professionals tackle a number of management challenges. Official maps of the Trail corridor are inaccurate, and extant trace is under-surveyed, the history, definition, and importance of the Trail are obscure, BLM - Old Spanish Trail Association partnerships are unorganized and underutilized, and burgeoning renewable energy projects consume limited fiscal resources and cultural resource staff hours. I explore these challenges and define successful strategies the California BLM is using to mitigate them. Regular

interagency and extra-agency application of these strategies will facilitate improved documentation, preservation, and promotion of this nationally significant cultural resource.

Oetelaar, Gerald (University of Calgary) and Alwynne Beaudoin (Royal Alberta Museum, Edmonton, Alberta)
[131] *The Days of the Dry Snow: Short and Long Term Cultural Adaptations to the Mazama Ash Fall on the Northern Plains*

The climactic eruption of Mount Mazama spread a thick layer of volcanic ash over 1,000,000 km² of western North America. The ash accumulation had a devastating impact on the continental flora and fauna which exposed a number of vulnerabilities in the social and subsistence strategies of the resident population. In particular, the long-term unpredictability in the availability of subsistence resources culminated in the depletion of the stored food supplies and forced the resident groups to seek the assistance of their relations living beyond the limits of the ash fall. As a result of this population displacement, the former occupants of the Northern Plains acquired new food preparation techniques and strategies for the long term storage of essential resources. To avoid similar disasters in the future, the interacting groups also expanded their social safety nets to ensure access to a large aggregate of people well beyond the limits of their respective homelands. Using data recovered from deeply stratified archaeological sites occupied before and after the ash fall, I will explore the vulnerabilities of pre-eruption societies through an analysis of the social and technological changes adopted by the hunter-gatherer groups after this unusual natural disaster.

Oetelaar, Gerald [131] see Beaudoin, Alwynne

Offenbecker, Adrienne (University of Calgary) and D. Troy Case (North Carolina State University)

[41] *Contact in the Northern Great Plains: An Assessment of Biological Stress among the Protohistoric Arikara*

The arrival of Europeans in North America represents a pivotal transition that altered the biocultural landscape of a continent. While many studies have generalized the contact experience as overwhelmingly deleterious, others have suggested that interactions between Old and New World populations may have been initially favorable in some places, including the Great Plains of the United States. The primary objective of our research is to examine temporal trends in the health status of Arikara villagers that may be related to the initial arrival of European explorers and fur traders in the Upper Missouri Valley. We accomplish this by comparing biological stress levels among precontact and postcontact Arikara populations, as indicated by the presence of enamel hypoplasia, porotic hyperostosis, and cribra orbitalia. Statistical analysis reveals significantly higher levels of systemic stress in the postcontact population, particularly among juveniles. We discuss these results in the context of varying subsistence strategies, dietary intake, and disease loads and highlight the importance of utilizing both juvenile and adult remains in health analyses of past populations.

Ogburn, Dennis (University of North Carolina at Charlotte)
[132] *New Perspectives on Prehispanic Empires in the Andes*

Taking a cross-cultural perspective, observations are offered for understanding imperialism in the prehispanic Andes. Empires are mechanisms to benefit elites and aspiring elites, and they essentially comprise a set of elite relationships. While empires can expand quickly, creating an enduring imperial state requires establishing strong relationships between center and provincial elites at various levels. This entails leveraging elite agency and promulgating a shared political ideology. Consolidating these relationships establishes elite participation at local levels and those elites come to participate to an extent in a shared imperial elite identity, which is expressed through an iconography of power

and other material means. Failure to consolidate these relationships at the local level can result in different imperial trajectories that may not be readily recognized in the archaeological record. One such trajectory is suggested as a model to potentially explain the key problem of shared elite ideology in the Middle Horizon, which has been a long-standing problem in Andean archaeology.

O'Grady, Patrick [128] see Nelson, Amy

Oh, Chang Seok [22] see Kim, Myeung Ju

Oh, Kang Won (The Academy of Korean Studies) and Kang Won Oh (The Academy of Korean Studies)

[289] *Changes in Interaction Spheres among Complex Societies in Liaoning during the Bronze and Early Iron Ages (Twelfth to Third Centuries B.C.)*

Material cultures in Liaoning went through four dramatic changes in the 12th, 8th, 6th, and 3rd centuries B.C. Such cultural shifts were closely interwoven with increasing social complexity and reforming interactions between centers and peripheries in Liaoning. For example, the spread of the Weiyingzi-type cultural assemblage resulted from the formation of complex societies in Kazuo region in the 12th century. In the 8th century, rising complex societies influenced the network of the Shiertaiyingzi material culture in Liaozi, west part of Liaoning. Two cultural traditions of the Nandonggou in Kazuo and the Zhengjiawazi in Shenyang were centers of trading relations in Liaoning in the 6th century B.C. Consequence of widening interactions is the formation of similar material cultures throughout Liaoning by the 6th century B.C. Yan state became a center of unifying cultural tradition in Liaoning by the 5th century B.C. Such unifying Liaoning culture influenced the material cultures in both northeast China and northwest Korea. The Early Iron Age sites in northwest Korea dating to the 3rd century B.C. showed intensifying cultural interactions with Yan, eastern Liaoning, and central Jilin.

Ohnersorgen, Michael [279] see Glascock, Michael

Oka, Rahul (University of Notre Dame) and Dianna Bartone (University of Notre Dame)

[100] *Reclaiming Poverty for Anthropology: How Archaeology Can Form the Basis for Understanding the Evolution, Endurance, and Ubiquity of Global Poverty*

Two processes seem to characterize the relationship between anthropology and poverty. First, anthropology has rejected 'poverty' and turned towards nuanced discussions of 'structural violence' and 'inequality.' Second, anthropology has become increasingly irrelevant in public policy decisions on structural violence, inequality, or poverty. Other social and health sciences continue to investigate 'poverty' as a debilitating human condition inextricable from contemporary global political economies even as they acknowledge the issues in defining and measuring it. In this paper, given the almost 10,000 years of data on inequality and complexity, we argue that anthropology, especially archaeology, have much to offer the ongoing studies on poverty and policies aimed at its alleviation. Accordingly, we call for anthropology to reclaim 'poverty.' We offer summary, debate, and cautionary consensus on the issues of defining and measuring poverty encountered in economics, political science, psychology, sociology, and the health sciences. We highlight recent economic analyses showing the correlation between poverty, credit, and material accumulation. We posit that these studies will enable archaeological anthropology to take the initiative in understanding poverty as larger human concern that predates our contemporary economy and to confront the room elephant: is poverty a necessary outcome of social complexity?

Okada, Mayumi

[141] *The Current Situation of Archaeological Heritage and Tourism in the World Natural Heritage Shiretoko*

In July 2005, Shiretoko, a peninsula of well-preserved wilderness of the northern Hokkaido, was registered as a World Natural Heritage site. Although Shiretoko contains rich archaeological resources from the dynamic Okhotsk culture and illustrates connections with Ainu descendant communities, the Japanese government has not recognized the important of indigenous cultural heritage in local Shiretoko tourism development. Few historical and cultural traces of Ainu people are evident in one of Hokkaido's most popular tourism destinations. The Indigenous Heritage and Tourism Working Group (IHTWG) has sponsored temporary exhibits of archaeological remains found from sites located in Shiretoko (such as the Chashikot B site) since 2008. To clarify current understandings of local archaeological heritage in Shiretoko tourism, IHTWG administered questionnaires to exhibit visitors in 2009 and 2010. Using questionnaire results, this paper discusses (1) how people recognize archaeological sites located in Shiretoko, (2) what kind of impression the exhibit makes on visitors; (3) what archaeology can do for promoting multi-vocal perspectives of history and characteristics in Shiretoko.

Okamoto, Kamijyou [66] see Wang, Qiang

Okrutny, Elizabeth [251] see Burch, Ashley

Okumura, Mercedes (University of Sao Paulo, Brazil) and Astolfo Araujo (University of Sao Paulo, Brazil)

[80] *Morphometric Evolution of Early Holocene Bifacial Points in Southern Brazil (Garivaldino Rodrigues, Taquari, Rio Grande do Sul)*

Regardless the great number of archaeological sites from Southern Brazil presenting bifacial points dated from the Pleistocene-Holocene boundary, not many detailed studies on their morphological evolution have been done so far. We present a morphometric study of projectile points excavated from the site Garivaldino Rodrigues (RS-TQ-58), located on the state of Rio Grande do Sul. Garivaldino presents a range of dates from 11.800 to 7.400 cal B.P. Ninety-four points from four stratigraphic levels were studied. Multivariate statistics applied to both the traditional and the geometric morphometric analyses have failed to reveal any important temporal changes. However, the univariate analyses of linear measurements have revealed an increase through time in the variation of all measurements. It has also been observed an increase in the types of raw material used to manufacture such points through time. The absence of change in the morphology of points has been observed in other cases in South America (Rick 1980; Borrero 1989), usually related to small groups and low levels of cultural innovation. On the other hand, the increase in the variability of linear measurements and the types of raw material might suggest an increase in population size and copying errors.

Olano, Jorge [214] see Sakai, Masato

O'Leary, Beth (New Mexico State University)

[13] *To Boldy Go Where No Man Has Gone before: Approaches in Space Archaeology and Heritage*

My paper will provide a current overview of the field of Space Archaeology and Heritage from its origins (2000 to 2012). I will explore the underlying theoretical framework of space archaeology, which not only studies the relationships between material culture and human behavior, but embraces the totality of human experience in that it can be studied in all times and in all places it exists. Space archaeologists can study both the past and

present and make substantive contributions to studies of human behavior that other disciplines cannot. The field eliminates spatial boundaries. With the advent of space exploration (ca. 50 B.P.) an exoatmospheric archaeological record was created and is increasing exponentially. The cultural landscape of space includes both sites and objects on and off Earth; it is necessary to evaluate the significance of the latter and treat them as important objects and places worthy of legitimate archaeological inquiry. A broad view of the diversity of foci will be explored including technology, life history, how objects construct their subject, popular culture, and the advent of space robotic "culture." My paper will investigate the routes for preservation, both national and international, under the increasing prospect of those objects and places being destroyed.

[13] *Chair*

O'Leary, Owen (JPAC-CIL)

[251] *The History of the Joint POW/MIA Accounting Command and America's Efforts to Recover Its Fallen Service Members*

The United States government has been actively engaged in the recovery, repatriation, and identification of its military personnel who have died on the field of battle for over 170 years. This paper will discuss how those efforts began, evolved over time, and were shaped by lessons learned from each of the major wars of the 20th century. This will include detailing the creation of specific organizations for the task, adoption and incorporation of anthropological methods and techniques, and the invention of concurrent return. Particular emphasis will be paid to the development of the modern efforts to account for the missing servicemen since the Vietnam War and how the various iterations of organizations have led to the present day Joint POW/MIA Accounting Command. This contextual background will establish the groundwork for understanding the unique and challenging task that JPAC currently undertakes.

[251] *Chair*

O'Leary, Owen [251] see To, Denise

Olenick, Carly Evelyn [149] see Jones, Terrah

Olguin, Ivan

[114] *Los contextos arqueológicos de las tumbas de Mitla.*

Mitla es bien conocido por la compleja y detallada arquitectura de sus palacios y recintos funerarios, producto de una larga tradición cultural que alcanzó su más refinada expresión hacia el período postclásico. Si bien diversos investigadores se han interesado por estudiar este sitio, en el que se evidencia el alto valor social de la concepción de la muerte y las tradiciones funerarias tanto en época prehispánica como en el presente, son insuficientes los trabajos que se han enfocado de manera general en los contextos arqueológicos hallados en sus tumbas, dentro del área urbana del asentamiento prehispánico. Tomando en cuenta la alteración que estos contextos han sufrido al paso del tiempo debido a la continuidad ocupacional, y teniendo en mente la incertidumbre en torno al origen cultural de sus contenidos, esta ponencia pretende retomar la interpretación arqueológica de estos contextos funerarios en busca de esclarecer su origen y significado.

Ollé, Andreu [98] see Evans, Adrian

Olivier, Morgane (ENS Lyon / IGFL), Christophe Hitte (CNRS / IGDR), Anne Tresset (CNRS / MNHN), Jean-Denis Vigne (CNRS / MNHN) and Hänni Catherine (CNRS / IGFL)

[20] *Phenotypic Variations in Ancient Dogs: A*

Gleam from the Past to Shed New Light on Domestication

The large phenotypic and genetic diversity of present-day dog populations suggests that their founders came from wide and varied wolf populations. Nevertheless, for three hundred years, men have operated intense artificial selection erasing past diversity. As a result, little is known about phenotypes of ancient dogs, wolves or of the early effects of domestication at the genetic and phenotypic levels on primitive dogs.

Paleogenetic analysis of ancient wolves and dogs' specimens enables us to understand the history of genes responsible for phenotypic changes, and infer the history of domesticated phenotypes. As genomic information is available for modern dogs (one genome of boxer, annotated sequences, SNPs...), there is easy access to information on specific genomic regions related to phenotypic traits susceptible to change between wolves and dogs due to the domestication process.

We studied specific SNPs on several genes and QTL regions related to phenotypic variation (coat color, size...). This genotyping of ancient samples, allowed us to link phenotypic information to genomic variations and clarify the genetic mechanisms that have been underlying evolutionary processes and adaptations during the domestication of dog.

Olsen, Karyn (Western University), Christine White (Western University), Fred Longstaffe (Western University), Kristin von Heyking (Ludwig Maximilians University Munich) and George McGlynn (Munich State Collection for Anthropology and Palaeoanatomy)

[79] *The Effects of Trauma and Infection on Intra-Tissue Carbon and Nitrogen Isotopic Variability of Bone Collagen*

Isotopic ($\delta^{13}\text{C}$, $\delta^{15}\text{N}$) variability in human tissues is regularly used to reconstruct diet with little knowledge of how much it might be affected by pathological conditions. Here, we address the effects of various pathologies on the carbon- and nitrogen-isotope compositions of collagen. Individuals who had either experienced recent bone fractures (evident by an incompletely remodeled callus) or active and systemic bone infection (osteomyelitis) were sampled from a Medieval period poorhouse cemetery in Regensburg, Germany, and a modern/historic Swiss anatomy collection. Fracture calluses or osteomyelitic lesions were sampled along with unaffected areas of bone from the same individuals. Both traumatic and infectious lesions had higher $\delta^{15}\text{N}$ values than the unaffected bone, which likely reflects negative nitrogen balances associated with increased muscle protein catabolism and urinary nitrogen excretion. The osteomyelitic lesions also had higher $\delta^{13}\text{C}$ values than those of unaffected bone. This difference likely reflects the changes in carbohydrate metabolism that accompany infection-induced anorexia or the loss of appetite associated with prolonged infection. Given that trauma and infection can greatly disrupt normal body metabolism, the isotopic composition of collagen formed during serious periods of illness is unreliable for dietary reconstruction.

Olsen, John W. [222] see Gillam, Christopher

Olson, Kyle [157] see Thornton, Christopher

Olson, Greg (Mercyhurst University)

[193] *Human Remains Recovery in a Fatal Fire Setting Using Archaeological Methodology*

There is a natural tendency for those involved in fire settings to become overwhelmed simply by the magnitude and destruction of the scene itself. One can easily become overpowered at scenes where there is large loss, and the path the investigator must take may be obscured by the scene. Fire investigations are often complex and difficult to interpret at first blush. Because of the potential for the fire investigator to become distracted, one must develop an analytical and systematic approach to scene investigations. It is expected that fire investigators with experience

and training in archaeological methods will successfully meet the rigorous test of the scientific method that is being emphasized in fire investigations. To date, the resulting recovery analysis has proven overwhelmingly that the application of archaeological methods at these types of scenes both supports and authenticates the utilization of these methods. After attending this presentation, attendees will understand the value of applying archaeological recovery methods at fatal fire scenes not only to maximize the amount of human remains recovered but also the associated artifacts surrounding the death.

Olson, Brandon (Boston University) and Ann Killebrew (The Pennsylvania State University)

[247] *New Directions in Three-Dimensional Recording in Archaeology*

From initial planning to final analysis, archaeology, by its very nature, is a destructive discipline consisting of a wide array of approaches, theories, and methods. The archaeologist, whether conducting a pedestrian survey across a vast landscape or excavating a small single-phase site, is obliged to record and present their results in a systematic and meaningful manner. While field recording methods deployed to identify, characterize, and parse collected spatial data have taken many forms, most represent two-dimensional platforms of an invariably three-dimensional (3D) subject. With recent breakthroughs in 3D technology, it is now possible for the archaeologist to quickly generate a spatially accurate, photorealistic 3D model of any target of interest ranging in size from an individual artifact to a landscape with a series of digital photographs using PhotoScan, a commercially available software suite developed by Agisoft LLC. With two years of rigorous field testing completed by the Tel Akko Total Archaeology Project, it is clear that full scale implementation of PhotoScan in archaeology is possible and will ultimately facilitate unprecedented accuracy in field recording, photorealistic digital heritage management, and a new exciting outlet for the dissemination of archaeological data at multiple levels of interest.

[247] *Chair*

Olszewski, Deborah, Maysoon al-Nahar (Department of Antiquities of Jordan), Jason Cooper (AMEC Earth & Environmental), Natalie Munro (Department of Anthropology, University of Connecticut) and Bilal Khrisat (Department of Conservation Science, Hashemite University)

[201] *The Early Epipaleolithic at KPS-75, Western Highlands of Jordan*

Test excavations in 2009 at the Early Epipaleolithic (Nebekian) rockshelter site of KPS-75 on the Kerak Plateau, about 12 km north of the Wadi al-Hasa, in the western highlands of Jordan, yielded substantial lithic assemblages, as well as faunal and phytolith data sets. Geoarchaeological investigations suggest that the site was occupied when standing water, perhaps seasonal, was within 1 km south of the rockshelter. Preliminary interpretation of microliths suggests two occupation phases. The earliest has narrow, nongeometric forms (double-arched) that elsewhere are dated between about 25,000 to 21,000 calibrated B.P. The later occupation contains numerous Qalkhan points in various phases of manufacture and also is associated with microgravettes, as well as double-arched pieces and narrow geometric forms. This later phase is undated, but likely falls between about 21,000 to 18,000 cal B.P. The large quantity of Qalkhan points is unusual, as most Nebekian sites yield only a few of these distinctive forms. The faunal assemblage is dominated by high-ranked, grassland species, such as gazelle, tortoise, wild ass, and aurochs, suggesting that residents were not long-term occupants of the site, but exploited local resources, potentially on a seasonal basis, before moving on.

[201] *Chair*

Omay, Barbara A. [38] see Rhodes, Jill

Omay, Barbara (Drew University), Jill Rhodes (Department of Anthropology, Drew University) and Joseph Mountjoy (Universidad de Guadalajara, Centro Universitario de la Costa)

[38] *Lessons in Taphonomy: An SEM Analysis of Suspect Cut-Marks from the Middle and Late Formative Periods of West Mexico*

The funerary custom typical to the Middle (800 B.C.) and Late Formative periods (200 B.C.-200 A.D.) of West Mexico is burial of articulated and disarticulated remains in either a pit or shaft and chamber tomb. The varying states of articulation indicate at minimum, the curation of remains prior to interment. Suspect cut-marks were identified in a number of burials leading to the question of excarnation, suggesting a more complex peri-mortem ritual than has previously been identified in this region. The cut-marks were found along the distal aspect of the ribs, various long bones, and the cranium in both adult and infant remains. They were identified at a number of sites across both time periods. Casts were taken in the field and cut-marks of forensic origin were included in the study for comparison. All casts were similarly mounted and processed for examination under a Scanning Electron Microscope. Magnification was set at 100 µm. Comparison was made across specimens and the end result was, at least in these specimens, nonconformity with the morphological appearance expected from a sharp implement as the causative agent. This contribution demonstrates the value of cut-mark analysis in solving questions of cultural behavior vs. taphonomic processes.

O'Meara, Joanne [51] see MacDonald, Brandi Lee

Omori, Kazutaka [214] see Lopez, Larry

O'Neill, Brian

[137] *In the Shadow of Mt. Mazama: Early Holocene Record in the Upper Umpqua River Basin, Southwest Oregon*

Early Holocene archaeological sites are generally rare in the interior valleys of western Oregon and researchers often rely on radiocarbon dating to confirm their antiquity. In the upper Umpqua and Rogue river basins, the cataclysmic eruption of Mt. Mazama 7600 years ago buried the landscape under a thick deposit of volcanic ash, obscuring evidence of past human occupation. Since 1981, investigations have uncovered an increasing number of archaeological sites beneath this ash. This paper focuses on what archaeologists have learned of the pre-Mazama (pre-7600) occupation of the upper drainage, placing these findings in regional perspective.

[137] *Chair*

Opitz, Rachel, Nicola Terrenato (University of Michigan), Anna Gallone (Gabii Project) and Marcello Mogetta (University of Michigan)

[105] *Translating Digital Practice: From Collection to Interpretation*

Digital data comes into play at three key stages in an archaeological project: data collection, data exploration/analysis/interpretation, and publication. A lot of attention has been paid to digital data collection methods—including the use of tablets in the field, databases, GIS and 3D modeling methods, digital photography, and geophysical survey. As projects heavily invested in digital data collection make their way to the analysis, interpretation and publication stages, a new set of challenges is appearing. The translation of digital data collection practices to interpretation and dissemination practices is not trivial, and the problems involved in manipulating, analyzing, interpreting, and creating convincing explanations and compelling narratives using digital data are substantial. We look at it, we interrogate it as best we can, but we're not confident enough in our

practice in these areas to present the analytical and interpretive process that links the digital data to the conclusions. In this contribution we focus on the analysis and interpretation of digital data collected through the Gabii Project, a significant excavation in Italy—leveraging the many tools for data exploration and visualization available. In particular we consider the role of 3d data and modeling in the interpretation and analysis.

Orange, Marie (Université Bordeaux 3, France), Tristan Carter (McMaster Archaeological Lab, McMaster University) and François-Xavier Le Bourdonnec (IRAMAT-CRP2A UMR5060, CNRS-Université Bordeaux 3)

[62] *Studying Near-East obsidian from Neolithic Syria: A Joint Analysis by SEM-EDS and EDXRF.*

This study details the elemental characterization of obsidian assemblages from two Syrian Neolithic sites, Tell Aswad (middle/late PPNB) and Qdeir 1 (final PPNB). Two complementary non-destructive techniques were employed: SEM-EDS which permitted the analysis of the smallest artifacts, plus EDXRF whose precision, speed and automation enabled us to characterise entire assemblages (a total of 622 artifacts) and fully discriminate the various source materials represented. Our analyses provided new information on the obsidian employed by the two communities, demonstrated the complementarity of the two analytical methods in a Near Eastern context and showed for the first time that EDXRF is capable of discriminating the peralkaline products of Bingöl A and Nemrut Dağ, two of the most important sources of the region.

Orchard, Trevor, Daryl Fedje, Jenny Cohen and Quentin Mackie

[137] *Persistent Places on Dynamic Landscapes: Sea Levels and a Pan-Holocene Human Occupation Site in Southern Haida Gwaii, B.C.*

Research in recent decades has highlighted a complex, locally variable sea-level history across the Northwest Coast of North America. This resulted in a dynamic coastal landscape throughout the Holocene, and yields poor archaeological visibility for many periods. Early- through mid-Holocene cultural deposits are often either stranded on raised landforms some distance from current shorelines or submerged beneath contemporary sea levels. Based on a detailed reconstruction of the local sea-level history, recent research in southern Haida Gwaii has targeted such mid-Holocene deposits. In particular research at site 924T in eastern Gwaii Haanas National Park Reserve and Haida Heritage Site is revealing a persistent use of this location over at least 5000 years. A series of occupations on sequentially higher paleo-beach terraces associated with a long-term decline in sea levels in the region speak both to the importance of this location from at least the mid-Holocene to the European contact period, and also document dramatic changes in subsistence and material culture through a period that is otherwise unknown in the region. These point to a close relationship between site locations and sea level histories, and reveal long-term continuity in the use of local areas in the face of this dynamic environment.

Ordoñez, María, Ronald Beckett (Bioanthropology Research Institute-Quinnipiac University) and Gerald Conlogue (Bioanthropology Research Institute-Quinnipiac University)

[1] *Forensic Anthropology and Paleomimaging: An Application of Traditional and Non-intrusive Techniques on Two Museum Collections in Quito*

This presentation is centered around the application of Forensic Anthropology and Radiology techniques to the study of archaeological human remains. We use the cases of the osteological collections at the Jacinto Jijón y Caamaño Museum in Quito to illustrate how museum collections can be studied by using an approach that combines traditional techniques in forensic anthropology (direct handling of the remains) with, in more recent

studies, non-intrusive techniques taken from radiology termed paleo-imaging (the use of X-Ray imaging, CT scanning and endoscopy, for example). It also emphasizes how the use of a multidisciplinary focus that includes ethno-historical recollections, physical anthropology, forensic anthropology and radiological imaging allows the researcher to not only construct biological profiles and a pathology reports, but contextualize the data recollected from osteological remains and complement other historical and archaeological data.

Orifeci, Giuseppe [214] see Lopez, Larry

O'Rourke, Dennis H. [71] see Beck, R

O'Rourke, Laura (RCUH)

[126] *An Olmec-Style Cylinder Seal from Yarumela*
The Yarumela Archaeological Project 2008 field season focused on Early and Middle Formative household contexts as a first step in understanding the development of social complexity in this early village. Yarumela is one of the earliest village sites in Honduras. It is also one of the earliest sites with monumental architecture, with structures dating to around 800 B.C. One of the most interesting finds of the season was the discovery of an Olmec-style clay cylinder seal. The style of the iconography indicates that the seal was created sometime around 1000 B.C. The presence of an Olmec-style artifact in an early village in central Honduras suggests that the people who lived in this place were tied into the broader patterns of social change in Early Formative Mesoamerica. In this paper I suggest that this special artifact is representative of important social changes in Yarumela at the end of the Early Formative, changes reflected in the subsequent construction of monumental architecture. This paper also discusses the importance of the seal as a powerful medium of communication and possibly as a means of social control in early complex societies.

[126] *Chair*

Orozco, Joseph (CSULA) and Joseph Orozco (Graduate student-California State University, Los)

[109] *Faunal Assemblage of Midnight Terror Cave*
Over the course of three seasons from 2008-2010, California State University, Los Angeles conducted an intensive surface survey of Midnight Terror Cave (MTC). These investigations documented extensive modification of the cave to create broad, level areas suitable for public ritual. The project also recovered extensive human skeletal material thought to be the remains of sacrificial victims. Further evidence of ritual is derived from the type of non-native faunal remains found in MTC's interior. During the course of the survey 682 animal bones were recovered and analyzed at Cal State L.A. The assemblage was found to be unusual in being very heavy in fish and bird bones. This paper analyzes the remains in terms of being a ritual assemblage and notes how the MTC assemblage differs from other cave assemblages.

Orozco, Joseph [109] see Orozco, Joseph

Orsini, Celia (Université Paris 1 Panthéon-Sorbonne, France)

[55] *Recycled Traditions and Innovations in Northeast Britain*
This paper presents the results of recent dissertation research on the archaeological evidence for cultural interactions in northeast England and southeast Scotland in the early medieval period. It explores how populations used the landscape to create and maintain their identity and territories in this time of change, a period in which northern Britain saw the fall of the Roman Empire, conversion to Christianity and the emergence of centralized kingdoms. By examining a selection of early medieval burial sites,

it is argued that the Tyne and Forth region was a zone of multiple contacts between the 5th and 8th centuries. A comparison of funeral practices will be undertaken to demonstrate the impact of socio-political events and the varied local responses they provoked.

Ort, Michael [131] see Elson, Mark

Ortega, Allan (Allan Ortega)

[46] *Vulnerable Groups among Postclassic Maya from East Coast of Peninsula of Yucatan: El Meco and El Rey Case Studies*

After the Maya Fall, circa A.D. 1441, the Yucatec peninsular Maya settlements, over all the east coast, formed autonomous groups by political entities that struggled among themselves for supplies of the region. From these entities, Ecab was the most important, and El Meco and El Rey were from this political entity. It is well known the differential access to food sources by gender and age of each individual in the Maya society; however, this varies from locality to locality, and therefore impacts the health status of each person. The goal of this presentation is to show how access to food, evaluated by osteopathological indicators analyzed in both skeletal collections from El Meco and El Rey, can be measured by age and sex and show the social inequities in Postclassic times.

Ortegón, David [144] see Dunning, Nicholas

Ortiz, Agustín [166] see Carballo, David

Ortiz Díaz, Edith [253] see Cockrell, Bryan

Ortman, Scott [16] see Grundtisch, Katie

Ortman, Scott (SFI/Crow Canyon)

[273] *The Physical World and the World of Discourse in Tewa Origins*

A key element of an archaeology of the human experience is understanding relationships between material conditions and the ways people understood them. This is important because social action is mediated through discourse and politics more so than factual understanding. In this paper, I summarize socio-natural conditions faced by Mesa Verde people shortly before the famous episode of collapse and migration to the northern Rio Grande, and use Tewa oral tradition and the pattern of change in material culture associated with migration as barometers for understanding how the people who lived through this episode interpreted the situation they faced and the social transformation they sought to achieve. This example illustrates the challenges involved in understanding social transformation in cases where fewer lines of evidence are available.

Ortmann, Anthony (Murray State University)

[284] *Investigating the Function of an Archaic Period Earthwork through Microartifact Analysis*

The functions of Archaic Period mounds in the Lower Mississippi Valley are poorly understood. Poverty Point's Mound C provides a unique opportunity to examine the function of one late Archaic mound. Recent excavations in Mound C revealed a complex construction sequence consisting of numerous, thin, flat-topped construction stages. The presence of features on the surfaces of some stages, coupled with micromorphological evidence for trampling suggests these mound stage summits were used for cultural activities. The nearly complete absence of macroartifacts, however, makes it difficult to discern the types of activities that were undertaken on these surfaces. Microartifacts recovered from these construction platforms provide an alternative perspective on

the nature of activities associated with this earthwork. The analysis of microartifacts suggests Mound C was used for distinctive, possibly ritual activities.

[284] *Chair*

Ortmann, Anthony [284] see Roe, Lori

Osborn, Alan (University of Nebraska-Omaha)

[130] *Poisoning Proboscideans: An Alternative Strategy for Hunting Mastodons and Mastodons during the Younger Dryas*

Recent studies suggest that many mammoth and mastodon kills throughout North America occurred during the Younger Dryas Cold Event (YDCE; 12,900–11,600 cal yrs B.P.). Traditionally, archaeologists have assumed that proboscideans were killed by means of a direct encounter hunting strategy employing thrusting spears or atlatl darts tipped with chipped stone points. Given this strategy, the prey animals are assumed to have died as a result of significant blood loss. This paper explores the feasibility of a PaleoIndian hunting strategy employing weapons that delivered lethal injections of plant alkaloid poisons. Poison hunting, then, would have important implications for research regarding proboscidean population dynamics, alternative forms of weapon technology, and revised methods for kill site investigation. Finally, we may discover that PaleoIndians were forced to adopt foraging strategies that deviated significantly from "optimal" patterns.

Osborne, Daniel [212] see Bleed, Peter

Oskam, Charlotte (Ancient DNA Laboratory, School of Vet & Life Sciences, Murdoch University, Perth), Morten Allentoft (Ancient DNA Laboratory, Murdoch University, Perth), Richard Holdaway (Palaeol Research Ltd and University of Canterbury), Chris Jacomb (South Pacific Archaeological Research, and Univers) and Michael Bunce (Ancient DNA Laboratory, Murdoch University, Perth)

[263] *Biomolecules Preserved in Eggshell Provides Insights into Archaeology*

Due to excellent biomolecule preservation, fossil eggshells have been widely used for reconstructing palaeoecology and palaeodiets, and as an exceptional medium for a variety of dating methods. Here we show that ancient DNA (aDNA) is also well preserved within the calcite matrix of fossil eggshells excavated from Madagascar (elephant bird) and Australia (emu) - with the record so far being 19,000-year-old DNA characterized from emu eggshell at Tunnel Cave, WA. Our data shows, when careful attention is paid to methodology, fossil eggshell contains a rich source of 'pure' ancient DNA and that eggshell represents a previously unrecognized ancient DNA substrate. We set out to investigate the application of aDNA and stable isotopes of eggshell from archaeological contexts. New Zealand's flightless birds and their eggs were consumed by the early Polynesian inhabitants following first contact ~700 years ago. Attributing eggshell fragments, from archaeological middens, to one of nine moa species can be problematic. However, the characterization of mitochondrial DNA and microsatellites from ~250 eggshells provided definitive species identifications to determine which moa were available for Polynesians to hunt in each area. As well as compiling accurate zooarchaeological assemblages, this approach provides new insights into moa biology, and extinction processes.

Osorpurev, Tserennadmid

[31] *Discussant*

Ostapkowicz, Joanna

[259] *The Sculptural Legacy of the Jamaican Taíno*

Jamaica's rich artistic heritage includes a small group of Taíno wooden sculptures (ca. A.D. 1200-1600) that have survived centuries in dry caves, placed there for ceremonies or for safekeeping. They document an innovative carving style, distinct to that seen on the neighboring islands of Hispaniola (Dominican Republic/Haiti), Cuba and Puerto Rico, yet sharing broad parallels. This artistic legacy has much to contribute to our understanding of Taíno ritual, belief and aesthetics. The paper will provide an overview of some of the recent directions in their study, including historiography, iconography, chronologies and material studies (the latter through radiocarbon dating, wood ID, GC/MS and stable isotope analysis). These sculptures are complex 'entities', with equally complex histories and stories to convey.

Osterholtz, Anna (University of Nevada Las Vegas)

[101] *Warrior, Soldier, Big Man: Warrior Ethos, Identity Formation and the Negotiation of Social Roles in Multicultural Settings*

While a sense of identity is what defines us, in reality we each have a multitude of identities that manifest based on social or cultural context. The role of the warrior is complex, as it often requires the temporary or long-term suppression of other roles while bringing about a greater sense of group solidarity and identity. Soldiers returning from WWI found re-assimilation into society difficult, as their experiences had altered their perceptions. Shared experience and practice, however, created a very cohesive group identity that crosscut socio-economic and ethnic lines. Additionally, in multicultural settings military service can act as a leveling mechanism for immigrants coming to a new place (e.g., the conscription of new immigrants during the American Civil War), both in the act of fighting and as a cohesive mechanism after war is over. By understanding the power of the warrior identity or ethos as a mechanism of identity formation and negotiation, this presentation explores the role of warriors in the modern world (e.g., United States, Canada, and Uganda) to better understand archaeological (e.g., Northwest Coast Chiefdoms and Teotihuacan) and ethnohistorical (Northwest Coast, Mexico, and Africa) accounts of warriors in antiquity.

[101] *Chair*

Ostericher, Ian [121] see Stewart, Haeden

O'Sullivan, David [23] see Romanowska, Iza

Otarola-Castillo, Erik [76] see Schoville, Benjamin

Otarola-Castillo, Erik (Harvard University), Emma James (School of Social Science, The University of Queens), Jessica Thompson (School of Social Science, The University of Queens), Jacob Harris (Institute of Human Origins, School of Human Evolution) and Agustina Massigogé (INCUAPA-CONICET, Facultad de Ciencias Sociales, Un)

[117] *No Longer Just a Pretty Picture: Differentiating between Experimental Bone Surface Modifications Using 3D Morphometric Analysis*

Studies of bone-surface marks are crucial to our understanding of the evolution of human subsistence behavior. Over the last several decades, however, identification of bone surface modifications has remained contentious. One historical problem is the lack of consensus over how to identify or differentiate marks from human and non-human actors and effectors. Most investigations rely on morphology to identify cutmarks and their patterning, discriminate these from non-human-behavioral processes, and identify the objects or agents responsible for making the marks. These range from subjective characterization of cutmark morphology by the naked eye to the use of high-powered microscopy such as Scanning Electron Microscopes (SEM). These approaches, however, are difficult to replicate, quantify, and compare. 3D

geometric morphometrics (GM), under the procrustes paradigm, has demonstrated its ability to discriminate between marks caused by human and non-human effector/actor combinations, while providing quantitative morphological measurements and description. Here we apply 3D GM to quantitatively differentiate mark morphology within a large dataset collected from a wide range of experiments. These include: human and ungulate trampling experiments, crocodile and hyena-ravaged bone assemblages, and butchery cut and percussed bone assemblages. Results strengthen statistical confidence in identifications, providing an incipient digital library with which to make quantitative comparisons.

Otero, Francisco [17] see Morales, Pedro

Overfield, Zachary (University of Texas at Arlington)

[119] *Resurrecting Old Pattonia: Uncovering the Lifeways of a Nineteenth-Century Shipping Port Community*

The 19th century was a period of tumultuous change for Texas, the United States, and Mexico. Revolutions, revolutions, civil wars, and national boundary disputes, unfolded dramatically during this era. Although the grand sweep of Texas history is well documented, there are innumerable smaller stories within that narrative that remain unexplored. One such story is the founding, use, and eventual abandonment of Pattonia, a shipping port community on the Angelina River in Nacogdoches County.

Founded in 1844, the port at Pattonia connected steamboat shipping routes from Galveston and New Orleans to East Texas until the late 1880s when it was abandoned. I incorporated several different methodological strategies at Pattonia to collect representative samples of material from across the entire community. The collected materials will be used to explore questions of social differentiation, gender, class, race, and economy within a small shipping port community. The relative quality and quantity of the household goods and their distribution across the site along with historical records conveys the nature and degree of social differentiation at this community. Through archaeological and archival analysis this poster will present the social differentiation present on the landscape and how the introduction of industrial capitalism impacted the people of Pattonia.

Overholtzer, Lisa (Wichita State University), Jaime Mata-Míguez (University of Texas at Austin), Enrique Rodríguez-Alegría (University of Texas at Austin) and Deborah Bolnick (University of Texas at Austin)

[140] *Weaving Tlacamecayotl Temporalities: The "Rope of People," Household Histories, and Time in Archaeology*

Archaeologists have long been captivated by burials because they capture a moment in time, a singular event in the otherwise chronologically imprecise multitude of practices often preserved in the archaeological record. Yet, as I demonstrate using a novel combination of analytical techniques, groups of household burials can also offer windows into other temporalities—individual lifespans, multigenerational family histories, and political histories of the local community and broader region. Moreover, these methods allow us to recreate how these temporalities are woven together. This paper examines the intersection of household social histories and individuals' lived experiences of community-level social, political, and economic transitions at the Postclassic central Mexican site of Xaltocan. This examination is supported by mortuary and osteological analyses, ancient DNA evidence, and Bayesian statistical modeling of radiometric dates of the skeletal remains of household members interred in an exterior patio space between 1330 and 1480 C.E. These data provide a fuller understanding of the social lives, memories, and relationships of some of the ordinary men, women, and children who lived on the margins of empire, but nonetheless formed its backbone. In conjunction, these lines of evidence allow us to consider time and temporality in archaeological interpretation of households and

communities.

Owen, Paige (Undergraduate Anthropology Student- ASU)

[89] *Connectivity and Persistence Internally and Abroad in the Southwest United States and North Mexico*

I plan to use the five archaeological case studies of Mimbres, Salt River Hohokam, Salinas, Zuni, and La Quemada for my research. By studying the relationship of diversity of exchanged objects to the persistence of a group I hope to identify whether there is a correlation between the amount of connections a cultural pattern possesses through exchanged objects and to what extent that culture persists. In turn using the diversity of these exchanged objects as possible marker for inequality I hope to answer questions concerning connectivity between the five cases studies and internally within them.

For the purposes of this research persistence of a group will be defined as continued use of an area, traditions, or other distinct markers utilized by a recognized cultural pattern over time.

To answer these questions concerning persistence and inequality I plan to gather archaeological data from various important sites within each case study. The data will be specific to artifacts that are considered possible markers of connections such as turquoise, macaws, shell trumpets, and copper. I then will also use ethnographic data and comparisons to help determine what sort of patterns and connections the data reveals.

Owens, Kim (SWCA)

[102] *Public Outreach: Striving for Balance while Presenting California Mission Archaeology*

The Alameda Corridor East (ACE) San Gabriel Trench Project is a high publicity project with many stakeholders. In particular, the data recovery excavations at the San Gabriel Mission archaeological site occurred in a highly visible area and drew a great deal of public interest. As a part of this project, SWCA was asked to provide public outreach to correspond with the archaeological data recovery. SWCA created brochures, posters, and show-and-tell artifacts for hands-on-learning; constructed a large viewing platform for organized tours of the site; and placed a webcam on the site for remote viewing. SWCA archaeologists, native Gabrieleño monitors, and ACE representatives spoke to over 3,000 visitors to the site, including school children, local historical societies, politicians, and the media. In the planning phase, the question of how to present the achievements of the missionaries while appropriately acknowledging the exploitation of local Native Americans presented itself. As archaeologists, we strive to be good stewards and impart an objective interpretation of history based on data while acknowledging any biases. Here we discuss SWCA's strategy of presenting a balanced view of this controversial history while keeping good relationships with stakeholders.

Ownby, Mary (Desert Archaeology Inc.) and Deborah Huntley (Archaeology Southwest)

[139] *Production and Exchange of Polychrome Pottery in the Upper Gila and Mimbres Valleys: Results from Neutron Activation and Petrographic Analyses*

The appearance of Maverick Mountain Series pottery at 13th century sites in the southern U.S. Southwest has been viewed as a hallmark for the movement of immigrant groups from the north. Made in the Kayenta style with locally available materials, Maverick Mountain Series pottery is believed to have influenced the widespread 14th-15th century Salado Polychrome tradition of southern Arizona and New Mexico. These ceramic wares share a polychrome design scheme and certain technological and design elements. Our NAA and petrographic analysis of over 400 polychrome and plain ware sherds from multiple sites in southeastern Arizona and southwestern New Mexico allows us to demonstrate technological continuity between the Maverick Mountain and Salado traditions. We are also able to build upon

Patty Crown's influential study of Salado Polychrome production and distribution, demonstrating local production of Salado polychromes at several Upper Gila region sites, as well as some exchange of both Maverick Mountain Series and Salado Polychrome vessels within the Upper Gila and Mimbres valleys. Our study highlights the utility of using multiple ceramic sourcing techniques and diverse statistical approaches to answer archaeological questions, but also acknowledges some of the potential difficulties in using these methods to interpret complex human behaviors.

Pääbo, Svante [222] see Fu, Qiaomei

Pailles, Matthew (University of Arizona)

[264] *Río Sonora Community Size: New Interpretations Based on Settlement Pattern Data and Intersite Variation in the Moctezuma Valley*

In this paper I present data from survey and excavations in the Moctezuma Valley of Northwest Mexico, A.D. 1100-1600. The prevailing model for this region is based on exploration era accounts of the 16th century. Previous researchers inferred large-scale polities with consolidated authority over substantial territories, developed trade economies, dense populations, and strong ties to the Casas Grandes region. Preliminary analysis of settlement pattern data, variation in ceramic styles between sites, and differential access to exotic materials do not support the interpretation of territorial polities nor significant large-scale community organization of any kind. The data instead reflect multiple small-scale communities with variable internal organization and strength of exterior ties. It appears previous interpretations may only be applicable to a subset of communities in this region and only if the spatial scale of interpretations is vastly reduced.

Pak, Sunyoung [22] see Jeong, Yangseung

Palacios F., Patricia

[238] *Análisis Textil de un entierro humano en el Templo de Omo M10*

En las recientes excavaciones de la temporada 2012 realizadas en el templo Tiwanaku de Omo en el Valley de Moquegua-Perú, se halló un entierro humano incompleto y disturbado. Ubicado en la plataforma superior hacia la esquina sur-este del templo (Cuarto 27), los restos humanos estaban junto con textiles que consistieron en una camisa completa en un 40 porciento aproximadamente. Este interesante textil de color natural con bordados decorativos en diferentes colores es una muestra cuyo análisis y comparación con otros textiles Tiwanaku de la zona nos darán evidencia de estatus y afiliación cultural basándose en el material, calidad, técnica y forma de este fragmento de camisa, teniendo en consideración la poca existencia de este tipo de material en el templo.

Palazoglu, Mine [124] see Tushingham, Shannon

Palka, Joel (University of Illinois-Chicago)

[65] *Death and Lacandon Maya Settlement Abandonment*

Archaeological investigations encountered abandoned nineteenth-century Lacandon Maya settlements containing large amounts of usable artifacts, such as metal axes, machetes, and knives. The artifact assemblages lend support to the scenario of rapid abandonment and no return to the sites. Through ethnographic analogy, Lacandon may have abandoned these settlements immediately following a death in the household, perhaps from

violence. Items belonging to the deceased were never collected because of their perceived connections to the souls of their owners.

Palka, Joel [140] see Kestle, Caleb

Palomo, Juan Manuel (University of Arizona)

[57] *Mortuary Treatments at the Ancient Maya Center of Ceibal, Guatemala*

Ceibal is located in the Maya Lowlands, in the southwestern region of Guatemala. Its occupation spanned nearly 2,000 years from the Middle Preclassic to the Terminal Classic period (1,000 B.C.-A.D. 1,000). During six field seasons (2006, 2008-2012), the Ceibal-Petexbatún archaeological project uncovered around 50 burials from various contexts such as open Plazas and residential groups, displaying different types of mortuary treatments and grave goods. The result of the bioarchaeological analysis provides new information about Ceibal Early Middle Preclassic population, and the continuity and change of mortuary treatments until the Terminal Classic period. In addition to the archaeological data, iconographic information is referenced to reconstruct possible activities on burial practices.

Pan, Yan (School of Life Science, Fudan University)

[212] *Aquatic Ecology, Anthropogenesis, and Resource Production in the Lower Yangzi Region during 10,000-6,000 B.P.*

The Lower Yangzi region is regarded as one of the primary origins of agriculture in the world. Most interests concerning the emergence and development of prehistoric agriculture of the area have been focused on rice. However, the sites of 10,000-6,000 B.P. recovered in the recent decade, including those of Shangshan, Kuahuqiao, Hemudu, and Majiabang cultures, offered us rich data to reconstruct and reinterpret the subsistence economy and human ecology there. More than 140 genus or species of plants are identified in conjunction with abundant animal bones, particularly fish and bird. The data are analyzed in an integral wetland ecology model considering human's impact. It is demonstrated that the role of rice in subsistence economy used to be over-emphasized. Rice was just one component of the agricultural complex and did not become dominant in diet until 6000 B.P. A variety of important economic plants, such as water caltrop, fox nut, job's tear, cattail, reed, could be managed or cultivated like rice in the same aquatic habitat. In a broader ecosystem, the wetland could be maintained and regulated by human for multiple resource production.

Panich, Lee M. [119] see Mathwich, Nicole

Paquette, James [119] see Anderton, John

Pardoe, Colin (Research Affiliate, Australian National University)

[177] *Territoriality and Conflict in Aboriginal Australia*

Given the pace and direction of European colonization, research into Aboriginal Australia has often focused on groups surviving in arid environments rather than on those hunter gatherers who lived in densely populated, rich environments. This paper focuses on the Murray River, the longest river in Australia, and the insights that biological anthropology and burial practices can give to questions of demography, territoriality, boundary maintenance, competition, and conflict. High levels of violence are evident in early and late Holocene skeletal remains from this region as well as in the historical record. Reasons for this will be explored.

Paredes-Rios, Freddy [38] see Maley, Blaine

Pargeter, Justin (Stony Brook University), Karl Hutchings (Department of Sociology & Anthropology, Thompson Rivers University) and Marlize Lombard (University of Johannesburg)

[98] *Using Velocity-Dependent Micro-Fracture Features to Determine Rates of Impact and Weapon Delivery Systems in an Experimental Hunting Context*

Mechanically-projected weapon systems, such as the bow and arrow, are a proxy for human behavioral flexibility, and are likely to have had a long trajectory in the African Stone Age. Identifying these weapon forms in the archaeological record is challenging, because of the near absence of diagnostic organic components. Studies in material sciences and experiments have shown that determining armature loading rates (the physical properties of contact between two materials such as the rate of collision and duration of contact), affecting the fracture of stone weapon inserts, is a potential means of differentiating weapon delivery systems. Velocity dependent micro-fracture features, specifically Wallner lines and fracture wings, are an objective means of determining these loading rates on stone tools used as weapon components. The boundaries of the loading rate regimes established for various weapons categories, however, remain to be independently validated in experimental and blind-test situations. The present study is the first in a series of projects assessing the identification, application, and accuracy of these boundaries, using a combination of hunting experiments and blind-tests. This paper examines the velocity dependent micro-fractures on a series of experimental flint backed tools used as hunting weapon components that were projected at known velocities.

Paris, Céline [39] see Bellot-Gurlet, Ludovic

Paris, Elizabeth (University of Southern Mississippi)

[140] *Integration and Durability in Postclassic Communities in the Jovel Valley, Chiapas, Mexico*

Like most social entities, communities are not inherently durable; they must be created and maintained by the interactions of their members. As such, the nature and duration of interactions within and between community members, and also between different communities, may shift over time. In ancient Mesoamerica, many communities underwent significant changes in organization, population, and political structure as a result of the collapse of powerful Classic period polities. Many communities also continued to experience significant demographic and political changes during the following Postclassic period, which shifted the nature of their interaction and degree of cohesion over time.

In this paper, I will examine the degree of integration and durability within and between households at Moxviquil and Huitepec, two Postclassic period sites located on opposite sides of the Jovel Valley in the highlands of Chiapas. Excavations at these sites reveal the creation and maintenance of economic and social ties both within and between these two sites during the Early Postclassic period, such that both settlements could arguably be considered part of a single community. During the Late Postclassic period, there is evidence of decreasing interactions within and between these sites, suggesting that these communities slowly disintegrated over time.

Park, Jungjae [70] see Kim, Minkoo

Parker, Daniel [5] see Lin, Sam

Parker, Megan (Georgia State University) and Terry Powis (Kennesaw State University)

[58] *Understanding Environmental Changes through Maya Ritual*

In a world that is growing increasingly conscious of its environment, it is important for us to understand how past societies adapted to environmental stress. More importantly, by studying the ways in which ancient cultures interacted with their environment, we can make steps towards preventing possibly harmful ecological changes in our own future. During the 2011 and 2012 field seasons, archaeobotanical remains were recovered from six cave sites and three rock shelters from the periphery of the Maya site of Pacbitun, located in west central Belize. Soil samples were taken throughout the caves, followed by the placement and excavation of 25 x 25 cm units. All of the soil from these units was subjected to the flotation process in order to separate paleoethnobotanical remains from the heavy fraction. Analysis of these remains is not yet complete, but we believe that a thorough examination will provide us with a better understanding of ancient Maya cave ritual. This data, coupled with environmental data from the region, will inform upon the influence of environmental changes to the ritual process. This research will serve to show how influential environmental factors can be on important cultural features, such as ritual.

Parker, Evan (Tulane University), Stephanie Simms (Boston University) and George Bey III (Millsaps College)

[65] *Over the Hills and Far Away: Maya Abandonment Strategy at Escalera al Cielo, Yucatán, México*

Between A.D. 950 and 1150, the inhabitants of the Maya residential hill complex Escalera al Cielo (EAC) rapidly abandoned their homes. Yet rich floor assemblages indicate that they expected to return, a rare archaeological signature with regard to strategies of detachment in ancient Mesoamerica. At EAC, ties to households, ancestors, and landscapes were never severed. These findings suggest that there are multiple ways in which established groups abandon households and communities and that such events need not be final. Instead, abandonment with anticipated return represents a social practice that can be examined archaeologically among not only nomadic and transient groups, but also within sedentary societies. Households and communities practiced such strategies for a variety of reasons, such as responding to catastrophic events, seizing opportunities for socio-economic improvement, and observing routinized religious practices. The type of abandonment strategy seen at EAC is compared to similar cases of abandonment, both historical and archaeological, with an anticipated return. Overall, the abandonment of EAC enhances our understanding of how and why groups detach from a particular place.

Parker, Alyssa (Millennia Research Limited)

[156] *Challenges and Opportunities for Analysis of 3D Point Cloud Data*

The collection of data, using a variety of spatial and attribute digital recording techniques that can be linked together in a relational database, produces a complex, attributed, 3D point cloud. This poses challenges and unique opportunities for analysis. 3D GIS software allows a wide range of visualization and analysis of 3D point data. ArcGIS 3D Analyst is used to display and analyse a rich 3D point cloud dataset. Challenges include visualizing a dense cloud of 3D points and interpreting patterns from it. However, the analysis options are much greater than they are for a traditionally recorded excavation. Techniques for analysis include symbolizing quantitative and qualitative attributes for visualization of patterns. Selective symbolization of certain attributes queried from the database simplifies the point cloud and allows patterns to be discerned more easily. Exact relationships between items are determined in 3 dimensions. Stratigraphic breaks recorded as points are transformed into overlapping surfaces, from which multiple stratigraphic profiles can be generated using cross-sections. Volumes of materials can also be accurately calculated using 3D volumetric shapes interpolated from the point cloud. Presentation of results can be dynamic and visually powerful using animated rotation of the symbolized point cloud.

Parr, Nicolette (Joint POW/MIA Accounting Command - Central Identification Laboratory)

- [138] *Diachronic Patterns of Health and Disease in the Naton Beach Burial Complex from Tumon Bay, Guam*

The current study is an investigation of the prehistoric Chamorro of Guam, in the Marianas Islands, to assess health and disease patterns over time. The transition from the Pre-Latte to Latte periods displays a shift in population size, diet, and subsistence strategies. These changes occur concomitantly with large-scale environmental and climatic fluctuations. It is predicted that cultural and environmental shifts will be accompanied by biological ones, as manifested by linear enamel hypoplasias (LEH) and carious lesions, due to increased stress levels and dietary changes. Significant differences in LEH frequencies were found between the Pre-Latte (16.5%) and Latte (45.0%) populations. The Pre-Latte individuals are less prone to LEH and thus may not have been exposed to high degrees of physiological stressors as the Latte. Climatic instability was more common in the Latte period and likely resulted in destruction of crops and reef systems, leading to reduced access to nutritional resources and subsequent decrease in health status. A significant decrease in caries rates occurs between the Pre-Latte (72.7%) and Latte (24.1%) populations. This pattern is contrary to the expected results as intensification of agriculture is often associated with a higher degree of caries and may be the result of betel-nut chewing.

Parris, Caroline [241] see Baron, Joanne

Parrish, Otis [111] see Wingard, John

Parsons, Ted and Roberta Gordaoff (University of Alaska Anchorage)

- [117] *Creating Site Orthophotos and 3-D Models for a House Feature in the Aleutian Islands*
We test the utility of "structure from motion" (SfM) software as part of the excavation of a 3400-year-old upland house (ADK-237) on Adak Island, Alaska. Low altitude aerial photographs taken with inexpensive digital cameras are merged with terrestrial digital single lens reflex images into large-scale photomaps and detailed 3-D models of site features. We find that the semi-automated software is simple to use and that the merged and rectified images it creates are accurate and easy to interpret.

Passeniers, Oona [227] see Van Gijn, Annelou

Passey, Benjamin [172] see Henkes, Gregory

Pate, Donald (Flinders University)

- [230] *Archaeology and the Scientific Method: An Interdisciplinary Process Involving Successive Approximations toward a Past Behavioral Reality*

Due to the influences of my mentor Dick Gould, I practice and promote archaeology as a behavioral science which examines relationships between material remains and past human behaviors in ancient, historical and contemporary time periods. Applying a critical scientific approach to archaeology involves a collaborative, interdisciplinary process which enables inferences about past human behaviors via the employment of a range of independent methods of analysis. As Walter W. Taylor argued, this approach to archaeological research results in successive approximations toward a past human behavioral reality. An educational grounding in the sciences and social sciences facilitates effective communication across disciplines and active involvement in team-based archaeological teaching and research. My 30-year

academic career in Australian archaeology, including the establishment of the Department of Archaeology at Flinders University, reflects adherence to these philosophies.

Patel, Parin [48] see Giessler, Kalena

Patel, Shankari (University of California Riverside)

- [168] *New Directions Courtesy of an Old Collection: Pilgrimage, Gender, and the Nepean Collection from Isla de Sacrificios, Mexico*

The Nepean Collection is the largest group of artifacts from Isla de Sacrificios in Veracruz, Mexico that the British Museum acquired from a British Naval Officer in 1844. Only one percent of the collection is on display and an even smaller portion of the artifacts had received scholarly attention. Previous researchers determined that Isla de Sacrificios served as an international Postclassic (A.D. 1000 – 1519) pilgrimage location. With permission and assistance from the British Museum, my dissertation research drew upon feminist and historical materialist methodologies to examine over two thousand artifacts from the Nepean Collection. The numerous female figurines and spindle whorls compared within the context of a larger regional history indicate a previously unknown feminine component to Postclassic pilgrimage practices. However, the larger insight gained included the realization of the immense value that old collections can provide for answering new and important archaeological questions.

Paterson, Alistair (University of Western Australia)

- [163] *Cruel Seas: Depictions of Maritime Activities and Rock Art as Evidence for Coastal and Island Use in the Colonial Period, Northwestern Australia*

In the Pilbara (Northwestern Australia) depictive traditions in rock art and other media were significant aspects of indigenous communication. With the arrival of outsiders in the nineteenth century significant changes were heralded by European colonialism, the demands of pearling and pastoralism, and the loss of traditional lands. In this rapidly changing social and physical environment Aboriginal artists depicted boats, Europeans, stock, and other aspects of the contested colonial domain in rock art. This reflected what we know from historical sources: people were forced to work on boats and were confined to offshore islands. Recent work explores how these events are potentially reflected through the archaeological record, including rock art. An analysis of the rock art of the coastal Pilbara necessarily move beyond the depictions of new motifs to a nuanced interpretation of indigenous depictive practices in a changing world.

Patrick , Faulkner [224] see Barham, Anthony

Pattee, Donald (University of Nevada, Reno) and Geoff Smith (Department of Anthropology-University of Nevada, R)

- [128] *A Changing Valley: Diachronic Shifts in Mobility and Toolstone Procurement in Oregon's Warner Valley*

X-ray fluorescence analysis (XRF) is a common technique that researchers use to determine the geochemical properties of lithic materials. It allows researchers to calculate the distances and directions that prehistoric artifacts traveled via direct procurement and/or exchange, and these data are often used to address questions of prehistoric mobility and toolstone procurement strategies. This study incorporates a large sample of obsidian projectile points ranging from fluted and stemmed Paleoindian (~11,000-8,000 BP) points to Archaic (~8,000 BP to Contact) points from Oregon's Warner Valley and considers diachronic shifts in mobility patterns and toolstone procurement strategies there. Additionally, data derived from the projectile point sample may offer insight into Warner Valley's place in the prehistoric

socioeconomic systems of the northern Great Basin. Evidence from surrounding study areas facilitates situating Warner Valley within this broader context.

[128] *Chair*

Patterson, Sarah

[158] *Using Grave Markers to Identify Trends in Immigration*

Research involving historic cemeteries and the information that can be gleaned from them is a growing part of archaeology today. This study examines the extent to which it is possible to determine trends in immigration based on the information available on grave markers from one historic cemetery, Historic St. Michael's Cemetery in Pensacola, Florida. A sample of grave markers was selected from the previously collected St. Michael's Cemetery Database and the data was analyzed with regard to available birthplace information. The data shows marked trends in immigration that coincide with observations from alternate historical and archaeological sources.

Patterson, David [215] see Bobe, Rene

Patterson, Susan (Rhode Island College)

[230] *To Follow in the Footsteps of a Master: The Indian Shaker Church and Tribal Identity in Northwestern California*

Richard Gould is not only a gifted archaeologist, for his work in ethnography and ethno-archaeology has informed my own career as a cultural anthropologist and shaped my life, both professional and personal. Dick wrote compellingly about the Indian Shaker Church among the Tolowa and other natives of northwest California, asserting that rather than assisting natives towards assimilation, the ISC was a vehicle for the maintenance of tradition. These traditions would, in time, inform the direction of their contemporary sovereign tribalism, emergent during Dick's research in the 1960's, and firmly in place during my research from 1999 to 2000. When Dick was conducting his archaeological excavation at Point St. George, no one could predict the impact that mass media and electronic communication would have on the politicization of Indian identity. And yet he astutely identified the ISC as the cultural bridge to 21st century retribalization. In this paper I will describe the role of the Shaker Church, as the repository of pan-Indian traditions, in facilitating the emergence of distinct tribal identities in northwestern California.

Pauketat, Timothy [15] see Pauketat, Timothy

Pauketat, Timothy

[15] *Cities, Would-Be Cities, and the Case of Cahokia*

Cities and would-be urban centers consist to variable degree of designed monumental spaces and dense, diverse populations. Ancient eastern North American centers from 3500 B.C.E. to the historic era were typically the former but seldom the latter until Cahokia. Yet Cahokia and later Mississippian towns were built of nondurable materials, and certain sorts of sustained commemorations by descendants were not possible. Based on Mississippian cultural history and comparisons with other early cities, I argue that urbanization was a process contingent on materiality and monumentality as much as people.

[15] *Chair*

Paul, Kathleen [63] see Butler, Michelle

Pavlenok, Konstantin [222] see Flas, Damien

Payne, Jennifer (Los Alamos National Laboratory)

[175] *Community Organization in Two Areas of the Southwestern United States*

Central to archaeological research in the southwestern United States is an understanding of the diverse ways people come together to form communities. Communities are organized in a variety of ways across this area of the United States. Differences and similarities reflect the needs of the individuals that make up the community as well as the common goals of the communities. Communities are dynamic and can change as a result of changing conditions and needs. Recurring and recognizable patterns of stability and change are visible in the archaeological record on the Pajarito Plateau in northern New Mexico and in the Mogollon region of southern New Mexico. Population aggregation appears to have been one of the primary ways in which communities formed in both of these areas. Recent research has provided information about aggregation and subsequent integration in these areas across time. This paper provides an overview of the architectural evidence from both of these areas as well as examples of the ways in which architectural evidence can be used to evaluate community organization.

Pazmiño, Iván [1] see Vasquez, Josefina

Peacock, Evan (Mississippi State University) and Timothy M. Ryan (Pennsylvania State University)

[284] *High Resolution Computerized Tomography as a New Method for Microartifact Analysis*

Although microartifact analysis has a number of applications, it remains relatively little used in archaeology due in part to the onerous time requirements for sample processing and analysis. One option for high-throughput classification and analysis of microdebitage samples is high-resolution computed tomography (HRCT) scanning. HRCT uses the attenuation of X-rays through an object to produce cross-sectional images. The high energy sources (typically 100 to >320 kV) are capable of penetrating dense samples like rocks and fossils and have the capability to resolve fine-scale structures ranging in size from less than 0.01 mm to 0.2 mm. We propose an alternative method for microartifact analysis in which raw field samples (small cores) are scanned and analyzed digitally using image analysis and visualization software. Automatic and semi-automatic image segmentation methods are being developed to allow quick selection and three-dimensional reconstruction of the microartifacts based on both morphological (e.g., size, shape) and density features present in the CT dataset.

Péan, Stéphane [69] see Lanoë, François

Pearson, Jessica (University of Liverpool), Lynn Meskell (Stanford University, USA), Carrie Nakamura (University of Leiden, Netherlands) and Clark Spencer Larsen (University of Ohio, USA)

[32] *Isotopes and Images: Fleshy out Bodies at Çatalhöyük*

For twenty years archaeological approaches to the body have tended to focus upon evidence confined to specific areas of expertise. Such separations in scholarship are understandable due to archaeological specializations in osteology or figurines, burial practice or stable isotope ratios. Here we attempt a reconciliation of evidence at Çatalhöyük that relates to the archaeological body: stable isotope analysis, physical anthropology and bodily representation through figurines, building installations, and the burial assemblage.

Once interpreted as evidence for a Mother Goddess cult, new studies of the corpulent figurines suggest a bodily significance of flesh, aging and maturity. The lack of gender differentiation is notable throughout the site, including in diet. However, the isotope

data does reveal that younger adults consumed different foods than other adults, which accords well with the particular attention to age and flesh in the representational sphere. This age-based pattern is also borne out in the burial assemblages: older individuals accrued the most diverse and biographical burials. We suggest that the Çatalhöyük inhabitants pushed beyond their corporeal constraints by emphasizing the significance of flesh in their material world as representational of age and maturity, which challenges older notions about matriarchy, gender hierarchies and the privileging of female fertility.

Pearson , Jessica [32] see Agarwal, Sabrina

Pechenkina, Ekaterina (Queens College of CUNY) and Xiaolin Ma (Henan Administration of Cultural Heritage)

[219] *The Consequences of the Mid-Holocene Climatic Optimum and Subsequent Cooling for Human Health in China's Central Plains*

Climatic change and associated environmental instability affect human health in several different ways. By altering the availability of particular resources and thereby influencing nutrition and diet they have an immediate impact on growth and development, as well as on oral health. Episodes of famine lead to the increased frailty of infants and also to growth arrest episodes in juveniles and subadults. On the Central Plain of northern China, climatic changes following the Mid-Holocene climatic optimum were coupled with rapid sociocultural changes in Chinese society. In this paper, we employ the frequency of linear enamel hypoplasias to document incidents of growth arrest during early childhood using skeletal collections spanning from the Middle Neolithic to the terminal Bronze Age. We document a negative correspondence between the frequency of such episodes in a given skeletal collection and the occurrence of other skeletal indicators of physiological distress, such as porotic hyperostosis and general periostosis. This negative relationship might be explained as resulting from selective mortality of frail infants with additional health problems.

Peck, Nina (University of Guam)

[7] *Subsistence and Coastal Resources: The Iron Age in San Remigio, Cebu, Philippines*

In June 2011, the University of Guam held a field school in San Remigio, Cebu, in conjunction with the University of the Philippines-Diliman and the University of San Carlos. The archaeological excavations focused on an Iron Age burial site located in the San Remigio Parish Church premises. Seven burials were found, with several whole earthenware pots among the grave goods. A large number of earthenware sherds were also recovered over the course of the field season. Marine shells exhibited signs of modification, possibly because of meat extraction. Carbon dating from the site makes this the oldest archaeological site in Cebu, placing it during the Philippine Metal or Iron Age at 1540-1400 BP. This paper presents subsistence strategies among the inhabitants of Iron Age San Remigio, Cebu and how this subsistence pattern influenced changes in the coastal landscape.

Peelo, Sarah (Albion Environmental), Linda Hylkema (Santa Clara University) and Clinton Blount (Albion Environmental)

[119] *The Indian Rancheria at Mission Santa Clara de Asís*

Missions were communities, or cascos, that included not only the church and its architectural elements but all spaces, inside and out. From historic documents and artist reconstructions, we have numerous depictions of indigenous villages (rancherias) part of Spanish mission communities. Despite our awareness of such components, few archaeological investigations have focused on the identification of rancherias, let alone other non-architectural features within those spaces. Archaeological investigation of these features provide an opportunity to explore spaces that were

inherently indigenous. Studying the experiences of those who lived outside of the church's walls provides a balanced understanding of mission life, and the ways the local Indians, the Ohlone, Miwok, and Yokuts, responded to the colonial process. Here, we highlight our findings from recent archaeological work in the Indian Rancheria at Mission Santa Clara de Asís emphasizing how this community reproduced Native traditions in a new social environment, incorporated foreign practices, and emerged with a new Mission Indian identity.

Peeples, Matthew [89] see Torvinen, Andrea

Peeples, Matt (Archaeology Southwest)

[218] *Social Networks and Material Diversity in Population Centers and Frontiers: An Example from the Chaco World*

In the American Southwest, settlements characterized by high degrees of material diversity tend to be relatively small, short-lived, and located in sparsely populated areas (frontiers). In many more politically and economically complex settings, including several Mesoamerican polities, the reverse is often true with high material diversity associated with large persistent centers (cultural "cores"). Such broad distinctions suggest that settings displaying different degrees of centralization may have been characterized by dramatic differences in the structure of regional social networks and distinct relationships between population centers and peripheries. Available evidence on the relative frequencies of ceramic wares, lithics, and other non-local objects in the Chaco region suggests that the relationship between diversity and settlement prominence in the northern Southwest may have more closely resembled patterns typical of hierarchical settings during the height of the Chaco regional system (A.D. 1050-1130). In this paper, I use methods from social network analysis and ceramic data from great house and great kiva sites across the broader Chacoan world to formally test the relationships between material diversity, settlement size, and persistence. I suggest that such a consideration of the social connections and relationships between frontiers and centers may highlight important aspects of political, economic and social organization.

Pei, Shuwen [222] see Peng, Fei

Pelletier, Natalie, Tania Blyth (Diagnostic Imaging Department, Quinnipiac University), Robert Lombardo (Bioanthropology Research Institute, Quinnipiac University), Gerald Conlogue (Bioanthropology Research Institute, Quinnipiac University) and Gary Aronsen (Department of Anthropology, Yale University, New Haven)

[260] *The Advantages and Disadvantages of Multi-Detector Computed Tomography (MDCT) and Computed Radiography (CR) for the Radiographic Examination of Human Skeletal Remains from a Mid-Nineteenth-Century Cemetery in Connecticut*

Multi-detector computed tomography, MDCT, and computed radiography, CR, were used in the investigation of human skeletal remains from a Mid-19th Century Cemetery in Connecticut. Both modalities prove themselves useful in a number of ways; however depending on the pathology or anatomy of interest one modality may be more appropriate than the other. A selection of images, describing their radiographic findings, technical factors, positioning techniques and comparison of each modality will be presented in order to clearly demonstrate the significance of radiographic imaging and the advantages and disadvantages of both modalities. In addition, the relative availability and potential costs associated with each modality will be discussed.

Pellitier, Natalie [260] see Conlogue, Gerald

Pelz, Ana [234] see Lailson Tinoco, Becket

Pena, Jose and Robert Tykot (University of South Florida)

[178] *Trace Element Analysis of Late Horizon Pottery from the Huancabamba Valley, Jaen-Cajamarca, Peru*

According to ceramic evidence, the pre-Hispanic occupation of the Huancabamba Valley began during the Initial period. This valley worked as a strategic area to establish relationships and trade with different regions such as Jaen and Bagua; the north coast of Peru; and the Cajamarca area. During the Late Horizon, a centralized power took control over the Andean area and the reorganization of different ethnic groups constituted changes in the material culture. The Incas built in the Huancabamba valley state production centers in order to control and keep the Inca Road System, which connected the north area of Peru to Ecuador. The ceramic assemblage recovered from Inca state sites does not show typical Inca pottery style or decoration from the heartland. It is possible that administrative centers built by the Incas provided the means to support state facilities such as pottery production. In addition, ethnohistoric evidence suggests that during the Inca period coastal communities were relocated to highland settlements in order to serve as officers in state facilities. Trace element analysis on Late Horizon pottery in this valley provides information on pottery provenance in the Cajamarca area, and the way in which the Inca state exercised control in new provinces.

Peña, Augustin [37] see Cucina, Andrea

Peng, Peng

[216] *Was Lost-Wax Casting Practiced in Bronze Age China? A Case Study of the Rim Openwork Appendage of the Bronze Zun-Pan Set in the Tomb of Marquis Yi of Zeng*

Scholars disagree about whether late Bronze Age Chinese metallurgy involved the lost-wax casting technique. The bronze Zun and Pan serving vessel set, recovered from the tomb of Marquis Yi of Zeng (d. 433 BC; Hubei Province) in 1978 offers an excellent opportunity to evaluate competing views. This paper reports findings from research on the bronze serving set and also work on other related bronze vessels, and concludes that lost-wax casting was used to make these vessels. This case study demonstrates that late Bronze Age Chinese metalworkers employed lost-wax casting as part of their technological tradition.

Peng, Fei (University of Chinese Academy of Sciences), Xing Gao (Institute of Vertebrate Palaeontology and Paleoant), Huimin Wang (Institute of Archaeology of Ningxia Hui Autonomous), Fuyou Chen (Institute of Vertebrate Palaeontology and Paleoanthropology) and Shuwen Pei (Institute of Vertebrate Palaeontology and Paleoanthropology)

[222] *Emergence of Late Paleolithic in China: A Technological and Cognitive Perspective*

The onset of Late(Upper) Paleolithic is traditionally marked by the appearance of complex technology and cognition ability. Increasing evidences in archaeological excavations and advances in chronology allow us to discuss the emergence of Late Paleolithic in China and Late Pleistocene cultural evolution in Northeast Asia in more detail. Some scholars have suggested that, in Northeast Asia, technological changes are linked with demographic variations that the early stage of the Late Paleolithic technology reflects the economic advantages inherent to Levallois core geometries. Shuidonggou Locality1(SDG1) provide important material to check this assumption because of its distinctive blade assemblage in China. Most of the previous studies followed a typological approach, a new study combined the techno-economic

approach of the Chaine Operatoire with an attribute analysis was applied to reanalysis the collections that were unearthed during the 1980's excavation. Two main blade reduction systems at SDG1 were identified. It shows striking technological and chronological similarities with the laminar assemblages in Siberian Altai. The technological analysis led to the exceptional discovery of an engraved core. This study provide an technological and cognitive perspective to understand the poorly known period in Chinese archaeology and late Pleistocene population dynamic in Northeast Asia

Peniche May, Nancy (UCSD)

[256] *Constructing Chronologies from Buildings: Excavations at Plaza B of Cahal Pech, Belize*

The archaeological site of Cahal Pech in the Belize Valley is characterized, among other things, by having a long occupation dating from the terminal Early Preclassic to the Late Classic period. The multiple explorations at the site have permitted to have a good understanding of the ceramic chronological sequence and have insights about some activities performed by the ancient occupants of Cahal Pech. Yet, we need to understand the complex evolution and variability of the architectural manifestations throughout this long occupation. As an effort to fully assess this architectural change and variability, during the 2012 field season of the Belize Valley Archaeological Reconnaissance Project, a large block excavation was conducted in Plaza B, where Cahal Pech was funded during Cunil times (1200BC-900BC). Information obtained through this excavation has permitted to build a complex architectural sequence dating from the terminal Early Preclassic to the Late Classic period. Along with data coming from previous explorations, this chronology building gives us insights about the spatial and sociopolitical changes that took place at Cahal Pech, especially during the earliest phases of occupation.

Peralto, Leon

[203] *Discussant*

Peres, Tanya (Middle Tenn State Univ) and Heidi Altman (Georgia Southern University)

[151] *From Ahwi to Anikahwi: Deer in Subsistence and Social Structure*

In the Southeastern United States white-tailed deer remains are recovered in abundance from late prehistoric archaeological sites and have been used to identify numerous social and cultural phenomena including differences in food consumption based on status, feasting, inter-site transport of foodstuffs, and regional variation in subsistence strategies. Meat, marrow, and hide were three important physical contributions of deer to the daily lives of southeastern natives; however, we argue the spiritual and social value of deer were equally important. We combine zooarchaeological analyses of white-tailed deer from Mississippian Period sites with both published and unpublished data from the Native American ethnohistorical, ethnographic and linguistic record. We examine the practices and beliefs that surround the human-animal interaction -- a set of relationships that still exists in communities today. Whereas the contexts for some traditional activities, such as painting deep inside of caves or constructing elaborate architecture, may have changed, native peoples in the southeast still live in environments with animals that are largely the same as their ancestors. Given this persistent context, we use ethnohistorical accounts and ethnographic interviews to provide meaningful insights into the symbolic and social significance of a staple food prior to the arrival of Europeans.

Peresani, Marco [291] see Naudinot, Nicolas

Perez, Juan Carlos [65] see Navarro-Farr, Olivia

Perez , Griselda [65] see Navarro-Farr, Olivia

Pérez , M.Carmen [63] see Sugiura, Yoko

Perez Robles, Griselda [290] see Fridberg, Diana

Perkins, Leslie and David Sandrock (SWCA Environmental Consultants)

[213] *Preliminary Report on Excavation Comparisons between Two Household Residential Groups along the Dos Hombres to Gran Cacao Archaeological Project in Northwestern Belize*

Household archaeology attempts to understand how households were ordered and how the house itself structures activities. This paper compares the excavation results between two household residential groups within the Dos Hombres to Gran Cacao (DH2GC) Archaeology Project area. One of the residential groups is located closer to the site of Dos Hombres; the other is situated roughly one km away near a middle management site. Comparison of production and consumption assemblages provides a basis for drawing inferences regarding the nature of cooperation, ownership, and status within the groups.

Perreault, Charles (Santa Fe Institute)

[11] *The Pace of Cultural Evolution*

Today, humans inhabit most of the world's terrestrial habitats. This observation has been explained by the fact that we possess a secondary inheritance mechanism, culture, in addition to a genetic system. Because it is assumed that cultural evolution occurs faster than biological evolution, humans can adapt to new ecosystems more rapidly than other animals. This assumption, however, has never been tested empirically. Here, I compare rates of change in human technologies to rates of change in animal morphologies. I find that rates of cultural evolution are inversely correlated with the time interval over which they are measured, which is similar to what is known for biological rates. This correlation explains why the pace of cultural evolution appears faster when measured over recent time periods, where time intervals are often shorter. Controlling for the correlation between rates and time intervals, I show that cultural evolution is faster than biological evolution; this effect holds true even when the generation time of species is controlled for; and culture allows us to evolve over short time scales, that are normally accessible only to short-lived species, while at the same time allowing for us to enjoy the benefits of a long life history.

Perri, Angela (Durham University)

[20] *The Hunting Dogs of Jomon-Period Japan*

The Japanese archaeological record has produced some of the richest and most numerous prehistoric dog burials in world, though their existence often goes unnoticed by the larger archaeological community due to a lack of translated material. Faunal material recovered from prehistoric Jomon sites (ca. 12,000-2,500 B.P.) shows a close relationship between Jomon dogs and people, especially at the large shell middens of the northeastern coast where groups were largely dependent on hunting terrestrial ungulates. This paper discusses the relationship between hunting methods, prey species, and environmental change in examining the role of dogs as important hunting tools (and group members) in Jomon communities.

[20] *Chair*

Perry, Elizabeth (SWCA Environmental Consultants)

[123] *Discussant*

Perry, Jennifer (CSU Channel Islands)

[209] *Field School Pedagogies: Agendas, Outcomes, and Adaptations*

Archaeological field schools oftentimes have multiple agendas relating to research, teaching, and public outreach. Most would agree that the integrity of the research and the quality of student education are simultaneously important. However, the intersection of these agendas may result in outcomes ranging from synergistic to conflicting and even disastrous. It can be difficult to balance these priorities because of the significant budgetary, logistical, and supervisorial constraints under which many field schools operate. Complicating this situation, not all students are the same with respect to their motivations, proficiencies, and goals. Although many would acknowledge the priority of training future archaeologists, the reality is that a large percentage of field school participants do not pursue archaeology as a profession afterwards. As the number of field schools grows as a means to fund research, and opportunities grow in response to a greater emphasis on study abroad and other forms of experiential education in the United States, what is our responsibility to the non-archaeologists who populate our field schools? I explore the pedagogical implications of this question, highlighting examples along a spectrum of possibilities ranging from limiting enrollment to greater inclusivity.

Peschaux, Caroline (Université de Paris 1 Panthéon-Sorbonne), Grégory Debout (Service archéologique des Yvelines) and Olivier Bignon (Centre National de la Recherche Scientifique)

[227] *A "Bead's Time" within the Hunter-Gatherer Populations of the Upper Paleolithic: Correlation between Personal Ornaments and Site Function in the Paris Basin (France)*

This paper focuses on the links between personal ornaments and the territorial organization of Upper Paleolithic hunter-gatherers societies. In sites, the beads series are dissimilar. They differ in quantity, variety, local distribution and stage of manufacturing (finalized objects, raw material, supports and waste). This diversity enables one to distinguish the production sites from the sites of occasional losses. Bead-work may have been segmented in time and space. Ethnographic studies show that bead-work was mainly carried out while the populations were mobile and settled, thus indicating that bead-work was done while on residential settlements at certain times of year. To check whether the making of personal ornaments during Upper Paleolithic is to be related to the sites functions, we have correlated the presence and the content of beads with the length of time, seasons and activities of several French sites in the Paris Basin dating from the Upper Magdalenian (-14 Ky BP) and the Badegoulian (-18 Ky BP). The purpose of this work is to identify whether there was a specific "Beads Time" and to model the role this time may have played in the territorial organization of Paleolithic hunter-gatherers.

Pestle, William (University of Miami), Christina Torres-Rouff (University of California, Merced), Mark Hubbe (The Ohio State University), Francisco Gallardo (Museo Chileno de Arte Precolombino) and Gonzalo Pimentel (Universidad Católica del Norte)

[217] *Moving Food, Moving People: Regional and Local Patterns of Dietary Variation in the Formative Period Atacama Desert, Northern Chile*

Using a burgeoning corpus of human, floral, and faunal stable carbon and nitrogen isotope data, the present work examines patterns of mobility and social interaction in northern Chile's Formative Period (1500 B.C.-A.D. 500). While the geographic barriers and harsh climatic conditions of the Atacama Desert together with substantial logistic considerations established certain constraints on human diet at the site and local (i.e. coastal, Loa River, oasis) levels, regional level dietary variation and the

identification of travelers (individuals with dietary signatures characteristic of foodstuffs not available at their place of burial and along exchange routes) speak to frequent and possibly even regular interzonal movements of people and/or foodstuffs. Here, we examine data on: 1) unique isotopic aspects of the region's available foodstuffs, 2) regional patterns of dietary variation considered in light of recently advanced hypotheses about the nature of mobility and social interaction in Formative Period northern Chile, and 3) intra-site dietary variation possibly attributable to age, sex, and unequal practices of food access and redistribution.

Peters, April and Bern Carey (Museum of Northern Arizona)

[218] *Social Identities in the Deadman's Wash Frontier Zone North of Flagstaff, Arizona*
A signature event in the prehistoric landscape of the Flagstaff, Arizona region was the eruption of Sunset Crater in the mid-to-late 11th century. Following that eruption three distinct groups, the Cohonina, the Kayenta Branch of the Ancestral Puebloans, and the Sinagua migrated into a region north of Sunset Crater from their cultural heartlands. These groups converged and interacted in this frontier region from 1075 to 1300 AD. An area twice the size of the Wupatki National Monument, called the Deadman's Wash Frontier Zone, is being surveyed on US National Forest lands. Hundreds of previously unknown, significant habitation sites have been recorded. A new, robust data set now exists from those sites in which distinct, cultural communities are being found that change through time. Using similarities in ceramic assemblages to infer participation in a social network, this research establishes the structure of prehistoric social networks in 25-year time intervals. The structure and change of social networks allows insights into how and with whom the prehistoric inhabitants of the region interacted and how those communities of interaction changed over time.

Peters Jr., Desmond [128] see Villeneuve, Suzanne

Peterson, Elizabeth (Simon Fraser University)

[5] *Mobility Variation among Hunting-Gathering Societies: Evaluating Risk Reduction through the Lens of Social Networking*
Building upon the current models of mobility, this study explores one specific possible driver of variation in mobility patterns found among hunting-gathering populations; that of social networking. By social-networking I mean the creation and maintenance of group relations as an adaption to the uncertainty of resource procurement due to environmental conditions (Jochim 1998; Kelly 1995: Ch. 5; Whallon 1989, 2006). This poster will be reporting on the results of a cross cultural analysis of ethnographic data on hunting-gathering groups from the recent past as a means to explore possible correlations between environmental biodiversity and network mobility in terms of visits. The data set is derived from Binford's compilation of ethnographically studied hunting-gathering groups as expressed in his 2001 work Constructing Frames of Reference. Focus is placed on three variables: environment, population size, and the mean size of the population conducting multi-group moves for networking. The overall goal for this cross-cultural study is to contribute further to our understanding of variation in hunting-gathering mobility by building upon past models. Results of such a study will enable us to broaden our understanding of variability in hunting-gathering mobility patterns in both the ethnographic and archaeological record allowing for a more complete picture.

Peterson, John [7] see Sanders, Mariana

Peterson, Emily (University of Washington) and Peter Lape (University of Washington)

[167] *Beyond the Beach: Exploring Connectedness and Isolation in Island Southeast Asia*

Island archaeologists are increasingly aware that in the context of human adaptive systems, simple measures of isolation like those used by biogeographers are insufficient for understanding the complex social interactions between human populations and the construction of boundaries in an island world. This paper will explore the potential applications of the concept of connectedness for measuring isolation as social distance rather than as a strictly geographic parameter, using case studies from Island Southeast Asia. This concept enables us to move beyond the beach to investigate interaction, both cooperative and competitive, and isolation from intra-island to region scales.

Peterson, Christian (University of Hawai'i at Manoa)

[179] *Conservative Ceramic Change and Its Impact on Social and Demographic Reconstruction from Regional Settlement Data*

The prehistoric ceramic assemblages of northeastern China vary very little across a vast area over thousands of years, complicating the definition of archaeological period boundaries and their subdivision into shorter phases. This paper explores the impact that conservative ceramic change has on the estimation of regional population and the delineation of community structure from settlement pattern data. In Neolithic northeastern China, as in some other parts of the world, the composition and characteristics of highly fragmented ceramic assemblages from residential contexts are poorly understood, so ceramic chronologies are based largely on subtle changes in form and surface decoration observed for whole vessels recovered from burials. Consequently, the tiny, worn and non-diagnostic pottery sherds that are the typical remains of prehistoric occupation encountered on survey can be extremely difficult to classify to archaeological period—let alone to assign to shorter occupational phases within periods that are exceptionally long. The possibility that surface sherds have been systematically misidentified is especially worrisome, since existing social and demographic reconstructions would require revision. Estimates of regional population and the scale of Neolithic communities would increase for some periods, and decrease for others. These and other issues are discussed at length, and corrective action suggested.

Peterson, John (University of Guam)

[221] *Co-opted Heritage: Political Action, Identity, and Preservation at the Pagat Site, Guam*

During the EIS process for the proposed U.S. Navy military buildup on Guam, a community activist group, We Are Guahan, protested the selection of an artillery range near the late pre-contact site of Pagat in northeast Guam. The site was used to rally native Chamorro resistance to the military buildup. The group led a coalition of community groups in a lawsuit seeking a restraining order against the project. The case was subsequently dismissed, but heritage preservation had become the focal point for community action against the buildup, and an expression of cultural identity. However, contemporary Chamorro identity is rooted in the late Spanish and early American periods of Guam's history, and traces to the 19th century and not to pre-Spanish indigenous culture on Guam. The latte stone has become a keystone of Chamorro identity, but Chamorro today have few cultural memories of pre-Spanish settlement. The political action was successful in firing public imagination off Guam, but arguably stalled the military buildup that is supported by the majority of Guamanians, Chamorro along with Filipinos, Asians, and Anglo-Americans. Unfortunately, the site of Pagat is now at greater risk of neglect once out of the limelight.

Petraglia, Michael

[131] *The Toba Super-eruption: Current State of Knowledge*

The Toba super-eruption was the largest volcanic eruption in the last two million years. Competing theories center on the degree to which the eruption impacted life on earth, one view claiming that

the event was devastating and catastrophic, while another suggesting relatively minimal impacts. A 10 year interdisciplinary project on the ecological and evolutionary effects of the eruption has been conducted in South Asia. The aim of this presentation is to highlight main findings and to review the most recent evidence relating to dating, environments and archaeological sites. Our conclusion is that while the Toba super-eruption had effects on terrestrial ecosystems, these were limited, temporary, and spatially variable, and certainly not as catastrophic as has been theorized. We conclude, using the most up-to-date archaeological information, that human populations in South Asia survived the eruption.

Petrie, Cameron (University of Cambridge)

[245] *Discussant*

Pettinelli, Elena [135] see Barone, Pier Matteo

Peuramaki-Brown, Meaghan (University of Calgary)

[287] *The Community as "Affective Assemblage": Low-Density Urbanization at Buenavista del Cayo, Belize*

In a recent article, Harris (2012) builds from Deleuze and Guttari (2004) to describe communities as the consequences of "affective assemblages"-relationships between people, places, things-operating within a range of specific scales both geographically and temporally. Buenavista del Cayo is a Classic period Maya center in the Lower Mopan River Valley of West-Central Belize whose life history of urbanization begins in the Middle Preclassic (ca.1000-350 B.C.E.) and persists until the Terminal Classic (ca. 780-890 C.E.). This paper adopts Harris' perspective in the presentation of an examination of the process of urbanization at Buenavista through an evaluation of relationships between people, their knowledge and "things", and the places -both public and private-they inhabit. The "community as affective assemblage" approach is demonstrated to successfully produce diverse and diachronic insights into the urbanization process at Buenavista on local, center-wide, and regional scales.

[287] *Chair*

Phaff, Brianne (Simon Fraser University) and Mike Richards (Department of Human Evolution, Max Planck Institute)

[138] *Spatial Variation of Biologically Available Strontium Isotopes in Fiji: Implications for Prehistoric Fijian Mobility*

This paper will discuss mobility patterns of prehistoric humans interred at the site of Sigatoka, Viti Levu, Fiji through the strontium (Sr) analysis of prehistoric human skeletal material and modern plant remains. Our dataset includes samples of human tooth enamel from 52 individuals interred at the western and eastern burial groups at Sigatoka, which span four discrete periods of occupation, as well as 56 samples of modern marine shell and plants from various locales in Viti Levu. The goal of this paper is to explore (1) whether sufficient heterogeneity exists in the biologically available strontium data we collected for Viti Levu to enable interpretations of mobility, particularly given the proximity to marine environments and the possible influence of marine strontium, (2) if appropriate heterogeneity exists, the fraction of local versus foreign individuals at the site through an analysis of strontium ($^{87}\text{Sr}/^{86}\text{Sr}$) values in human tooth enamel, and (3) the possibilities and limitations of analyzing large datasets of biologically available strontium to produce interpretations of human mobility in an archaeological context.

Phillips, Rebecca (University of Auckland)

[129] *Contextualizing Human Mid-Holocene Mobility Strategies in the Fayum, Egypt*

The beginning of the Holocene marks the initiation of varying degrees of human dependence on domesticated plants and animals. Egypt's geographic position has led to its incorporation into a number of models of Neolithic development including those of southwest Asia, but also North Africa and the Mediterranean basin. Traditional models of Neolithic development in Egypt suggest proximity to the southwest Asian 'center' of domestication, in addition to ecological context, had an impact on resulting socio-economy and settlement pattern. The mid-Holocene occupation of the Fayum Depression is incorporated into this model. Mobility studies, either reconstruction of human movement or the contextualization of mobility strategies, are closely linked to this model in the Fayum, however, few studies exist where human movement is empirically documented in the archaeological record. A method to document artifact movement, a proxy measure for human movement, is applied to three assemblages from geographically distinct locations in Egypt to contextualize the Fayum occupation, including Sais in the Nile Delta and Nabta Playa in the eastern Sahara. The results challenge traditional interpretations, but also provide insights about the outcomes of different combinations and intersections of local social, economic and environmental variables during this period.

Phillips, Natasha (University of Auckland)

[129] *Assessing Variation in Temporal and Spatial Scales of Early to Mid-Holocene Human-Environment Interaction in Northeast Africa*

The relationship between early and mid-Holocene human behavior and arid to semi-arid environmental changes is considered at both a regional and local scale in the Egyptian eastern Sahara. As a chronological proxy for human behavior, hearth remains and associated archaeological, archaeobotanical and archaeozoological evidence are analyzed in relation to independent proxies for paleoenvironmental change from Nabta Playa, Dakhleh Oasis and the Fayum Depression. The degree with which human behavior changed in response to localized environmental shifts (e.g., lake and terrestrial resource availability) or large-scale paleoenvironmental processes (e.g., the north-south movement of the Inter-Tropical Convergent Zone) is assessed and compared to regional settlement system reconstructions and typologically defined units (i.e., Epipaleolithic and Neolithic). Geomorphological and post-depositional processes are considered potential biases when assessing generalized models on human-environment interaction.

Phillips, Caroline [165] see Kahotea, Des

Phon, Kaseka [249] see Dega, Michael

Picard, Jennifer (University of Wisconsin-Milwaukee), Jennifer Haas (Great Lakes Archaeological Research Center) and Ricky Kubicek (Great Lakes Archaeological Research Center)

[25] *Sourcing Late Woodland Collared Ware and Madison Ware Vessels from the Finch Site, Southeast Wisconsin*

The Late Woodland collared wares and uncollared Madison Ware vessels of Southeast Wisconsin continue to generate questions surrounding cultural affiliation, spatial distribution and temporal association. For example, research has shown differential regional distributions of Aztalan Collared, Starved Rock Collared and Point Sauble Collared Vessels. The degree to which the presence of Madison Ware versus collared ware vessels is indicative of cultural difference is a persistent question also. Recent excavations at the Finch Site (47JE902), a multicomponent habitation near Lake Koshkonong, produced a diverse Late Woodland ceramic assemblage. Vessels recovered include a variety of collared ware and Madison Ware vessels. Compositional analysis was conducted on these vessels using a portable X-ray

fluorescence analyzer (pXRF). The goal of this research is to provide insight into the manufacture and distribution of Late Woodland ceramic styles at the Finch site and throughout the region.

Pickering, Robyn (School of Earth Sciences, University of Melbourne)

- [11] *"The Time Has Come": The New Role of the U-Pb Geochronometer Applied to the South African Early Hominin Sites*

South Africa has a rich early hominin fossil records, concentrated mainly in cave deposits, which, until recently, have been poorly dated and often considered the poor cousin of the vast, well dated deposits of East Africa. Recent advances in U-Pb dating of carbonates (mostly cave carbonates or speleothems, particularly flowstones) are beginning to change this. Flowstones layers sandwiched between fossil bearing sediments can be treated as chronostratigraphic marker horizons and play an analogous role to the volcanic tuffs in East Africa. The key to successful U-Pb dating is isolating uranium rich horizons within the flowstones, making careful sample pre-screening a necessity. Most U-Pb dating work has focused on the 'Cradle of Humankind' caves, where ages can now be assigned to the early hominin species; ages can be further refined by investigating the palaeomagnetic signals preserved in the sediments and flowstones. Flowstones from caves several kilometres apart have U-Pb ages within error of each other, suggesting some large scale cyclicity behind the alternating deposition of flowstone and cave sediment. U-Pb dating has also been successfully applied to the southern Cape coastal cave sites of Pinnacle Points and attempts to date calcrete horizons from the western Cape coast are underway.

Pierce, Daniel E. [279] see Glascock, Michael

Pietruszewsky, Michael, Hallie Buckley (Department of Anatomy and Structural Biology, Univ) and Dimitri Anson (Department of Anthropology and Archaeology, Univer)

- [27] *Polynesian Origins: Biodistance Studies of Crania, Mandibles, and Some Lapita Skeletons*

Biological distance studies, especially those based on cranial and skeletal morphology, continue to provide physical anthropologists and bioarchaeologists with an exceptional set of mathematically based methods for understanding population relatedness and population history. Because of the demonstrated correlation between phenotypic and genotypic similarities, studies of cranial form, most notably cranial measurements, occupy a central role in modern biodistance studies. This paper examines the results of multivariate statistical procedures applied to measurements recorded in modern and prehistoric crania and mandibles from the Pacific, including the largest samples of intact Lapita mandibles from the SAC site on Watom Island, New Britain, Papua New Guinea. The analysis of cranial measurements indicates affinities between Polynesian and island Southeast Asia. The analysis of mandibular measurements demonstrates that the Lapita associated mandibles from the SAC site are morphologically most similar to mandibles from eastern Melanesia, and that mandibles from Polynesia are most similar to mandibles from Southeast Asia. While these results do not support any of the previously proposed models for Polynesian origins entirely, the evidence from biodistance studies supports an ancestral Polynesian homeland in Wallacea and not one within geographic Melanesia.

Pietruszewsky, Michael [27] see Kadohiro, Karen

Pietruszka, Andrew [251] see Esh, Kelley

Pietruszka, Andrew (Joint POW/MIA Accounting Command) and Richard Wills (Joint POW/MIA Accounting Command)

- [251] *Forensic Archaeology Underwater: JPAC's Inventory, Investigation, and Recovery of U.S.*

Casualties of War from Submerged Sites

Members of JPAC Recovery Teams travel throughout the world to recover Americans missing from the Vietnam War, the Korean War, World War II, and the Cold War. A growing concern over the past ten years has been the recovery and identification of remains from submerged sites. Currently, worldwide, some 3,616 unique loss incidents, accounting for over 10,000 individuals, are believed to be underwater. In this paper we examine the development of underwater investigations and recoveries at JPAC, the inherent difficulties of conducting forensic archaeology underwater, and the critical role of underwater sites in providing the fullest possible accounting of all American's missing as a result of the nation's past conflicts.

Pigott, Vincent (University of Pennsylvania Museum)

- [216] *Discussant*

Pike, Scott (Willamette University) and Jordan Loos (Willamette University)

- [224] *The Use of pXRF on In Situ Floor Deposits to Interpret Activity Areas within Monumental-Scaled Structures at the Ness of Brodgar at UNESCO's Heart of Neolithic Orkney World Heritage Site, Orkney, Scotland*

The current study is part of a broad research program to assess the utility of pXRF on active excavations. A Bruker Tracer III-SD pXRF was used to analyze in situ floor deposits of monumental-scale Structures 8 and 10 at the Late Neolithic site of the Ness of Brodgar in UNESCO's Heart of Neolithic Orkney World Heritage Site in Orkney, Scotland. Multiple analyses of over 200 gridded sample locations were analyzed using two different instrument configurations to target elements with specific fluorescent energy ranges. The resultant spectra were quantified and the data normalized to the Raleigh (elastic) scatter peak of the incident x-ray beam. Spatial contour mapping of the data suggests different use activities within different areas of the structures including the likely location of a pigment-producing workshop in Structure 10. This is significant, as the site has produced the earliest known interior painted walls in all of the British Isles, and possibly northern Europe. The pXRF data, when coupled with excavation data, are providing significant insight into the function and use of space in the largest buildings excavated thus far at this important and unparalleled monumental-scaled Neolithic temple complex.

Pikirayi, Innocent

- [15] *Early Second Millennium A.D. Future Cities of Southern Zambezia: Great Zimbabwe as an Urban Complex and Center of a State*

There is nothing novel about current discussion on urban design, architecture, energy saving and environmental sustainability when one considers the pre-European, African city. For 13th century Great Zimbabwe and its hegemony one must accept that it was more than an oversized African village. Categorized by antiquarian Theodore Bent during the 1890s as one of the 'ruined cities of Mashonaland', Great Zimbabwe was a town, a central African one, but a metropolis nonetheless. It comprised many parts - elite residences, ritual centers, public forums, markets, as well as houses of commoners and artisans. It housed a large population of about 20000 people, within a complex of massively stones-walled futuristic megastructures. Its growth had an impact on its inhabitants, energy resources as well as the immediate and broader physical environment. At its fluorescence, it was one of the largest settlements in sub-Saharan Africa. How one defines such site revolves around centralization of political power and how such power mobilized labour, economic resources, and wealth in southern Zambezia.

Pilaar Birch, Suzanne (University of Cambridge)

- [269] *Communicating Archaeology through the Social*

Media Knowledge Exchange

The Social Media Knowledge Exchange is an Arts and Humanities Research Council (AHRC) funded framework in the UK that facilitates the dissemination and communication of research by Ph.D. students and early career scholars. This poster describes and shares some of the preliminary results of a project that works within this framework to not only create digital community scrapbooks but also uses other forms of social media to facilitate the exchange of archaeological knowledge between early career academics and the public via the internet. The project recognizes the gap between making research not only open access but accessible. Digital scrapbooks are research, illustrated and explained. In the format of short podcasts, salient points of a given research topic are drawn as they are explicated, allowing the viewer to both listen to and visualize what is being described. The use of social media allows for feedback and input from users of the material in the constructions of future "scrapbooks". This ongoing project will culminate in the production of a mini-series of collaborative scrapbook podcasts highlighting current research at the Department of Archaeology and Anthropology, University of Cambridge and has implications for public dissemination of archaeological research and knowledge-sharing in wider perspective.

Pilloud, Marin [12] see Schwitalla, Al

Pilloud, Marin and Mary Megyesi (Central Identification Laboratory, Joint POW/MIA A)**[251] Human Remains in a Glacial Environment**

A glacial setting presents a unique set of environmental parameters that leave a distinct taphonomic signature on bone. This signature is distinct from those seen in water or dry land environments and may be confused with other processes. Moreover, low temperatures slow bacterial reproduction thereby impeding the decay process. This delay could extend the interval that bone may respond in a perimortem fashion. It is important for the anthropologist analyzing human remains to understand taphonomy in a wide range of environments to accurately interpret peri and postmortem bone alteration.

A glacial environment presents multiple forces that can act on bone to include extreme temperatures, changes in temperature, and glacial movement. These forces lead to taphonomic modifications such as abrasion, fragmentation, cryoturbation, scavenging, and hydro-fracturing. Forensic cases recovered by the JPAC-CIL are discussed to describe the unique taphonomic signature cased by glacial processes and identify key patterns that can aid anthropologists in recognition. In addition, the preservation of bone and soft tissue is explored as well as potential for DNA extraction.

Pillsbury, Joanne (Getty Research Institute)**[59] Discussant**

Pimentel, Gonzalo [217] see Pestle, William

Pineda De Carias, Maria-Cristina (National Autonomous University of Honduras), Nohemy Rivera (National Autonomous University of Honduras) and Cristina Argueta (National Autonomous University of Honduras)**[166] Stela D: Sundial of Copán, Honduras**

This paper shows how the Maya of Copán, Honduras used Stela D as a sundial. Reviews of archaeological investigations show that in the northern sector of the Main Plaza of Copán Archaeological Park, Honduras, poles and unfinished stelae could be used to measure time and associated rites. We constructed a Stela D model to study the behavior of the shadows cast at different times

of day and at different dates of the year such as solstices, equinoxes and zenith Sun passage. As a result we found out how this Stela served as a time marker. The analogy of the shadows cast with bodies of snakes; supports the iconographic interpretation of Stela D.

Pink, Christine (Joint POW/MIA Accounting Command)**[272]*****Striking Out and Digging In: The Effects of the Rise and Fall of the Wari Empire on Population Genetic Structure in the Peruvian Andes***

Archaeological evidence suggests that during the Middle Horizon (A.D. 600-1000) the Wari imperialist agenda influenced many populations on a broad geographic scale. The goal of this study was to detect the possible effects of Wari imperialism on the intensity of interaction between regional populations in the Peruvian Andes. Biological distance analyses based on cranial nonmetric data were used to identify biological affinity between populations and over time as a proxy for social interaction. Regional samples dating to the height of the Wari culture during the Middle Horizon were compared to those from the Late Intermediate Period (A.D. 1000-1400) after the collapse of the empire. Results indicate that populations were more genetically isolated after the collapse of the Wari Empire. Geographic patterns are also evident among the samples with regard to biological distances. These results have important implications for understanding social interaction and how it may be impacted by the economic, political, and ideological ambitions of an empire even in the absence of direct imperial administration.

Piper, Phil [20] see Larson, Greger

Pippin, Douglas (State University of New York at Oswego)**[261]*****"A Very Laborious Task": British Colonial Policy and the Establishment of Fort Haldimand on Carleton Island (1778–1784)***

British policy in the American Colonies—leading up to the Revolutionary War—restricted colonial expansion, and discouraged settlement on the frontier. When that war broke out, maintaining control over the Great Lakes region was vital to British interests. They were hampered by their colonial policy, however, that resulted in few civilian communities in the upper St. Lawrence Valley and westward. In 1775 the new Continental Army attempted to exploit this weakness, and launched an attack on Canada that ultimately failed. In the years that followed, the British re-fortified the Great Lakes and St. Lawrence Valley. They struggled, however, to maintain transportation over the great distances and provide adequate supplies. At the head of the St. Lawrence River, Carleton Island functioned as a shipping depot, refugee base, and military hub between the upper posts and the cities of Montréal and Québec. Archaeological and historical evidence indicates that the active transport at Carleton Island led to a diverse population with respect to nationality, ethnicity, occupation, and socio-economic status. By examining not just the soldiers at the fortification, but the Carleton Island community in a broader context, a greater understanding emerges for post-war British settlement pattern in Upper Canada.

Piscitelli, Matthew [70] see Alarcon, Carmela

Piscitelli, Matthew (University of Illinois-Chicago) and Carmela Alarcon Ledesma (PAURARKU)**[285]*****Ritual is Power: A Multidisciplinary Exploration of Early Ceremonial Architecture at the Late Archaic Site of Huaricanga in the Fortaleza Valley of Peru***

This paper describes the results of fieldwork to investigate 3rd millennium B.C. temples on the coast of Peru. Field methodologies were designed to examine the changing nature of ritual practices

performed by early leaders as they systematically incorporated religion into their base of power. The Late Archaic Period (3,000-1,800 B.C.) witnessed the appearance and florescence of multiple large scale communities with monumental platform mounds and large sunken courts. Recent excavations have also revealed a number of much smaller scale temple structures at larger sites that bear many similarities to the classic Mito temples found in the highlands. These temple structures reflect non-public rituals with face-to-face interaction and provide an avenue for investigating the role of ritual and ideology in the emergence of complex political systems. This study presents the results of innovative analytical techniques used in the excavation of a series of small-scale temples at the site of Huaricanga in order to explore variation in ritual practices in the evolving complex polities on the Peruvian coast during the Late Archaic Period.

Pitblado, Bonnie (Utah State University), Molly Boeka Cannon (Utah State University), J.M. Adovasio, Megan Bloxham (Utah State University) and Joel C. Janetski (Brigham Young University)

[87]

Reuniting the Four-Decades-Lost Pilling Fremont Figurine with His Mates: Human Intrigue, Cutting-Edge Science, and Ethical Challenges

Our poster focuses on the well-known Pilling Figurines, a collection of a dozen unbaked clay figurines crafted around AD 1000 and collected 1000 years later by ranchers in the Range Creek (eastern Utah) area. The poster overviews the 1950 site find; subsequent travels of the collection within and well outside of Utah; the loss of a male figurine 40 years ago; the apparent reappearance of the lost figurine in November 2011; the efforts of researchers to demonstrate that the original had been returned; and discussion of the collection within broader Fremont context. We also touch upon the importance of collections like the Pilling assemblage to museums, land management agencies, researchers, and the public.

Although the SAA submission system permits listing only five total submission authors, our poster includes important contributions by additional co-authors: Bud Pilling (son of the gentleman who collected the figurines); K. Renee Barlow (who documented and dated the site); Kathleen Anderson and Steven T. Nelson (who performed geochemical analyses of the assemblage); Sally J. Cole (on Fremont iconography); Byron Loosle (BLM archaeologist, Utah); and Pamela Miller (long-time curator of the USU-Eastern Prehistoric Museum, which has housed the figurines for many of the last 60 years).

Pitezel, Todd (University of Arizona)

[97]

Hilltop Signals of Ritual Practice in the Casas Grandes World, Chihuahua, Mexico

Hilltop features in the Casas Grandes world have been referred to as "atalayas," a Spanish word meaning watchtowers. But, this term masks variability in feature composition and use during the Casas Grandes Medio period (A.D. 1200-1450). During this time, one or more of at least five rock feature types were constructed on 29 hilltops. The configurations of these features vary, but they conform to components maximally expressed at Cerro de Moctezuma. A GIS analysis shows that Casas Grandes hilltop sites could have been signaling locations, with Cerro de Moctezuma being the most intervisible site. At the same time, recent excavation within Cerro de Moctezuma's atalaya indicates that it supported ritual observances. We describe hilltop features in the context of their surrounding valley settlements to demonstrate that these places signaled ritual practice across the Casas Grandes world.

[97]

Chair

Pitezel, Todd [97] see Pitezel, Todd

Pitter, Sharmini (Stanford University), Nerissa Russell (Cornell University), Ian Hodder (Stanford University) and Richard P. Evershed (University of Bristol)

[9]

Food Residue Fatty Acid C and H stable Isotopes as Proxies for Evaluating Cultural and Climatic Change at Çatalhöyük, Turkey

An extensive study of the organic residue associated with the Neolithic pottery of Çatalhöyük has further refined the timing of dairy production on-site after following the methods of a previous study (Evershed et al. 2008). The combination of this new information with the faunal and stable isotope records of the same site has provided a more detailed account of changes in animal management strategy over time. Although the animal origins of dairy at this particular settlement are still unclear (cattle vs. sheep/goat), this study clearly demonstrates the importance of combining information from multiple methods in furthering our understanding of archaeological settings. In addition, a newly developed palaeoenvironmental proxy may provide a direct link between changes in local precipitation levels and changes subsistence practices by assessing stable hydrogen isotope (δD) values of fatty acids extracted from pottery residues. This study provides an in-depth look at some of the oldest dairy residues found to date as well as environmental and social factors that may have contributed or resulted from the transition to secondary product use during the Neolithic.

Pittman, Holly (University of Pennsylvania)

[157]

The Bronze Age of Exchange on the Iranian Plateau

Evidence from recent excavations in the region of Jiroft in the Halil River Valley of south central Iran establishes the presence of actors from across the Middle East in this region. Links to Central Asia, the Indus valley, the Persian Gulf and southern Mesopotamia can be seen through the residue of administrative activity, and in particular through the glyptic impressed on clay container sealings. This evidence augments and enhances our understanding of the role of the Iranian plateau in the vibrant phase of interaction during the third millennium BC that underlies the rise of complex societies across the region.

Platt, Sarah [178] see Woodburn, Michael

Pluciennik, Mark (University of Leicester)

[49]

Differential Processes ...

Socio-cultural evolution has a life across many disciplines and stages, from a broadly-construed anthropology to philosophy, colonialist actions, contemporary geopolitics, and public understandings of human history and the status of others. Even within its classic modern form (from the mid-eighteenth century onwards) social evolution cannot simply or continuously be ascribed to the more material or more social tendencies of archaeological theory. Rather, the leitmotif tends to be 'progress' of one form or another. This includes technologies, modes of subsistence, settlement, or production; or the evolution of or 'towards' cultural traits such as monogamy, religion, literacy, societal size, or socio-economic complexity. But what happens to understandings of socio-cultural evolution when viewed through the lens of Difference Theory? What are the implications of dissonance and non-correspondence between the materiality of the archaeological record and the almost always heterogeneous social (and other) construals of that record, past and present, for concepts of historical process? Must the long-term only ever be understood as post-hoc historical accommodations, rather than cogent explanations? How can systematic generalization ever be informative, or offer a persuasive 'answer'? Difference Theory triggers a critical reexamination of some of the foundations of philosophies of history from a specifically archaeological perspective.

Pluckhahn, Thomas [167] see Thompson, Victor

Plunk, Lindsay

- [6] *Chemical and Mineralogical Analysis of Varney Red Filmed Ceramics from the Lower Mississippi River Valley*

Varney Red Filmed ceramics are a common part of Early Mississippian assemblages in the Lower Mississippi River Valley. Results of x-ray diffraction (XRD) and thin-section petrography will be presented from several Early Mississippian sites in the region. A better understanding of Varney Red Filmed ceramics and the Early Mississippian culture in the Southeastern United States can be achieved through the chemical and mineralogical study of these ceramics.

Plunket, Patricia (Universidad de las Americas Puebla) and Gabriela Uruñuela (Universidad de las Americas Puebla)

- [63] *The Cholula-Teotihuacan Relation Revisited*

Based on his 1954 analysis of ceramics from excavations at Cholula's Great Pyramid, Eduardo Noguera concluded that Cholula was conquered by Teotihuacan early in the Classic period and consequently was home to many ethnic Teotihuacanos. On the other hand, scholars working at Teotihuacan, like James Bennyhoff and Evelyn Rattray, recognized a strong Cholula influence in the Tzacualli phase ceramics from the Basin of Mexico metropolis, but they did not envision large-scale immigration from Cholula or any political intervention. In this paper we reconsider the relation between the two Classic cities based on their material culture and discuss alternative possibilities for their interaction.

- [114] *Discussant*

Poister, Nicholas [125] see Brown, Kaitlin

Pokines, James T. [224] see Ames, Christopher

Polcyn , Marek [32] see Marciniak, Arkadiusz

Polk, Michael (Sagebrush Consultants, L.L.C.)

- [168] *Seeking Storage Where None Seems to Exist*

Since February 2009, the primary curation facility in the State of Utah has refused to accept historic archaeological collections, citing that such acceptance violates its purpose and ability to properly store such materials. As a contractor who regularly deals with historic archaeological sites, a number of which we have excavated, the absence of a facility to properly store the recovered materials has created serious challenge for our company. In this paper, I describe these challenges and alternative means that we have discovered to curate artifacts. I also provide broader perspective about the subject, applicable in many other places in the country.

Pollack, David [40] see Killoran, Peter

Pollock, Susan

- [30] *Commensality and Painted Pottery Traditions in the Late Fifth Millennium in Southwestern Iran*

An integral part of Henry Wright's studies of early states and their immediate predecessors in southwestern Iran has been a consideration of the production and exchange of craft goods, among them ceramics. His work has helped to move our understandings beyond simple comparisons of the outward appearance of finished goods to consider forms of production and circulation. In this paper I will examine another element, namely

how ceramic vessels were used in contexts of commensality and the social implications of their uses. My focus is on the late 5th millennium painted pottery traditions in the Susiana Plain and the Kur River Basin.

Polloock, Jacob, Ashley Grimes (Department of Anthropology, University of Utah) and Lisa Benson (Department of Anthropology, University of Utah)

- [148] *Exploring Lithic Assemblages in the Uinta-Wasatch-Cache National Forest*

In recent years much attention has been given to high altitude sites around the Great Basin as discoveries have increased; however, there is a lack of systematic mapping of these locations. This project is designed to analyze sites across the Uinta-Wasatch-Cache National Forest by 1) Mapping known lithic assemblages across the varying vegetation zones (Transitional, Canadian, Hudsonian, and Alpine), and 2) To analyze the occupational span of these sites. A comprehensive compilation of prehistoric sites and potential patterning of human behavior at varying elevations across the forest will help the archaeological community to better understand why human populations were converging at such heights.

Ponkratova, Irina [131] see Keeler, Dustin

Ponomareva, Vera [131] see Keeler, Dustin

Pool, Christopher A. [33] see Jaime-Riveron, Olaf

Pool, Christopher (University of Kentucky), Philip Arnold (Loyola University of Chicago) and Ponicano Ortiz (Universidad Veracruzana)

- [275] *Radiocarbon and Ceramic Chronologies of Matacapan, Veracruz, Mexico*

The ceramic chronology worked out for Matacapan by Ortiz and Santley is a lynchpin for archaeological research in the Tuxtla Mountains. Radiocarbon dates submitted in the 1980s, however, produced large standard errors, most on the order of 100 to 300 years. In this paper we present a new series of radiocarbon dates for the site and discuss their implications for the prehistory of Matacapan and the Tuxtla Mountains.

Poot, Paulina Ivette [33] see Rivas, Javier

Popelka-Filcoff, Rachel (Flinders University), Tiffany Reeves (Flinders University), Philip Jones (South Australian Museum) and Claire Lenehan (Flinders University)

- [181] *Differentiation of Binders in Aboriginal and European Painted Artifacts using Pyrolysis Gas Chromatography Mass Spectrometry*

Binders are used to adhere pigments to each other and to the support, and compounds used vary between cultures. After European settlement in Australia, Aboriginal Australians began using European-style binders as well as those obtained from native flora and fauna, however when and how this transition occurred is unclear. There has been extensive characterization of European binders, but much less of Aboriginal media. Such characterization could provide a basis for conservation, restoration, authentication, and dating of Indigenous artifacts from these time periods, as well as provide insight into Australian history.

This research has focused on optimising a pyrolysis gas chromatography mass spectrometry (Py-GCMS) method to analyse a wide range of binding materials. This involves rapid heating of a sample to form small volatile compounds that are subsequently separated and detected to determine the chemical composition of the sample, and requires only very small samples (0.5 mg) and minimal sample preparation, making it highly

advantageous for use in analysing valuable artifacts.

A method capable of distinguishing between binder types and materials from European and Aboriginal cultures has been developed, and a library of known binders has been compiled for comparison to Indigenous objects for identification.

Popov, Alexander [194] see McKenzie, Hugh

Popp, Brian (University of Hawaii)

[138] *Geochemical and Climate Modeling Evidence for Holocene Aridification in Hawaii*

Valuable records of Holocene paleoclimate for the central subtropical Pacific have been developed from peat deposits and lake sediments. Increases in sedimentation rate between 10,000 and 6,000 cal yr B.P. in peat deposits from coastal, montane and subalpine areas in the Hawaiian Islands that receive predominantly trade wind precipitation imply increased moisture. The apparent increase in moisture coincides with evidence for increased moisture above the trade wind inversion. On the other hand a record of carbon and hydrogen isotope values of individual n-alkanes derived from the leaf waxes of terrestrial plants extracted from a 13.5 m sequence of limnic sediments in a sinkhole on the leeward coastal Oahu, Hawaii are consistent with a shift in the local vegetation from C3 to C4-dominated flora and decreased moisture over this time interval. The vegetative changes are consistent with a response to decreased overall water availability mainly due to reduced wintertime precipitation. Model simulations of orbitally-induced increases in insolation along the equator during the Holocene provide evidence for wintertime drying in Hawaii and in the eastern subtropical North Pacific. In this talk, I review records used to construct paleoclimate in Hawaii and compare them to tropical climate change across the Pacific Basin.

Poppiti, Vincenzo [33] see Kimber, Tom

Porter, Anne

[146] *Pastoralism and the Proliferation of the Polity*

This paper argues that the perceived disjuncture between pristine (fourth millennium) and secondary (mid-third millennium) state formation in greater Mesopotamia arises from the misperception that cultural continuity can only be carried by sedentary settlement systems. A widespread and long-lasting break in occupation intervened between the retraction of the first state system, the Uruk, from the north, and the rebirth of complex society in this region. Two separate geneses of the state therefore seem necessary. From the perspective of mobile pastoralism however, there is a seamless narrative to tell where the rise and spread of the polity across greater Mesopotamia is a single process. Pastoralists were intrinsic members of, and dynamic forces in, the creation of the intersecting polities of the fourth millennium and their extension over space. When that system collapsed pastoralists regrouped and relocated, carrying with them the essential elements of its political practice, as they established new relations with the landscape during the early third millennium – relations that culminated in the urbanization of the mid-third millennium. The material manifestations of complex society were thereby reconfigured across space, but the social, political, and religious components of complexity remained intact throughout this time.

Porter, Benjamin [149] see Ames, Nicholas

Porter, Benjamin (University of California, Berkeley), Benjamin Porter (University of California, Berkeley), Alan Farahani (University of California, Berkeley) and Melanie Miller (University of California, Berkeley)

[263] *Catching Crabs in the Desert: Isotopic Insights*

into Human-Animal Relationships in Early Iron Age Central Jordan

Archaeological remains of brachyurans (e.g. crabs) have often been overlooked as potential paleoenvironmental and paleoclimatic proxies in contrast to other marine and terrestrial invertebrates such as mollusks and landsnails. The potential for fine-scale regional paleoclimate reconstruction based upon these organisms' behavioral ecology has yet to be examined. This paper presents isotopic and morphometric analyses of archaeofaunal remains of Mediterranean semi-terrestrial freshwater crabs (*Potamon potamios*) from the archaeological site of Khirbat al-Mudayna al-'Aliya (KMA). KMA lies on a southern tributary of Jordan's Wadi al-Mujib, approximately 40 kilometers east of the Dead Sea. Excavations at the site recovered architecture, artifacts, and ecofacts dating to a single-period occupation during the early Iron Age (ca. 1000 BCE). Oxygen and carbon isotopes from these archaeofaunal remains were analyzed in conjunction with a novel two-year study of the modern Potomonautid population to ascertain the biophysical interactions between the organism and environment. This study also explores the comparative validity of these past ecological relationships through the examination of contemporary samples collected from other wadi systems. The implications of this research bear upon the loci of interaction of the ancient community with the wadi landscape, mobility, resource acquisition, and human-animal relationships

Ports, Kyle (Humboldt State University)

[213] *Stepping into the Underworld: Preliminary Analysis of Cave Investigations at the Dos Hombres to Gran Cacao Archaeological Project (DH2GC)*

Caves and subterranean features are important aspects of the sacred landscape of the Maya region. This paper will provide interpretations of preliminary survey and excavations of several subterranean features located within the Dos Hombres to Gran Cacao Archaeological Project (DH2GC). By analyzing the spatial characteristics and providing artifact analysis, this paper explores the utilization of subterranean features by the ancient Maya and its ramifications on settlement analysis. This paper will also include a comparative analysis of caves located in the Programme for Belize Archaeology Project (PfBAP) region. The investigation of these features is integral to the understanding of the role that caves played in ancient Maya hinterland settlement.

Poteate, Aaron (North Carolina State University), Scott Fitzpatrick (University of Oregon), Meagan Clark (University of Oregon), Jessica Stone (University of Oregon) and Alyson Harding (North Carolina State University)

[2] *Amerindian Mollusk Exploitation during the Late Ceramic Age at Coconut Walk, Nevis, West Indies (ca. A.D. 850-1450)*

Islands provide a unique opportunity to elucidate natural and cultural change due to their fragile ecosystems and heavy reliance on marine resources by human populations. In this paper, we add to the current knowledge of prehistoric Caribbean island subsistence strategies and human environmental interaction by examining the exploitation of mollusks from the Late Ceramic Age site of Coconut Walk on the island of Nevis in the northern Lesser Antilles. Results from a robust assemblage of more than 63,000 MNI and 79 discrete taxa from a large 5 x 5 meter midden area, suggest that: 1) three taxa (*Nerita tessellata*, *Cittarium pica*, and *Lithopoma tuber*) were the preferred species, with *N. tessellata* comprising 62% of the overall assemblage; 2) there was increased exploitation of mollusks generally through time; and 3) there is evidence of increasing size of at least one species, *N. tessellata*, over the course of site occupation. The research provides important insight into mollusk use on Nevis, and the role that a limited number of species had in human consumption patterns. Questions arise as to whether cultural and/or natural processes affected mollusk size, and how the Nevis data compare with other prehistoric shellfish assemblages in the Antilles.

Potter, James (PaleoWest Archaeology)

[175] *Household Action and the Construction and Destruction of the Ridges Basin Community*
 Rather than the passive outcome of people living together, communities are produced through social action, a primary locus of which is the household. Yet the community also creates structure which guides household-level decisions. This interplay between household action and community structure produces a tension that can alter the nature and organization of the community over time and in some cases tear it apart, sometimes violently. This paper explores the formation, development, and dissolution of an early prehispanic community in Southwestern Colorado. At its height the Ridges Basin community, dating from A.D. 750-825, comprised approximately 75 households spread across the basin in pit-house clusters. Data indicate that households in these clusters were diverse in their backgrounds and social identities, regularly exercised violence against one another, and were variably connected to other communities and the larger outside world. The result was a community that developed and changed rapidly, exhibited fluid boundaries and volatile social relations among households, and came to a quick and violent end. The study reinforces communities as complex, multi-scale, fluid arrays of social relations that emerge, persist, and end through people's actions and practices.

[123] *Discussant*

Pottier, Christophe

[49] *Digging the History in Angkor (Cambodia)*
 In many ways, Angkor is characteristic of the large monumental sites of Southeast Asia, as it plays a major and often foundational role in the national histories of modern nations. Angkor also illustrates remarkably how -and on what basis- these "histories" were reconstructed with different materials, largely with the discovery and restoration of monumental vestiges, and the decryption of the epigraphic corpus and its interpretation in an historical perspective. Archaeology was often then expected just to provide material evidence for the intellectual reconstructions of social phenomena. Yet, the historiography of Angkor shows that archaeology has a strong ability to move beyond this role and to produce seminal additional types of information and interpretation. From the example of the archaeological excavations he conducted for the last 12 years in search of the urban origin of the Angkor region, the presenter will illustrate how the archaeological reality helps to deeply reconsider our interpretative schemes by confronting some seemingly solid historical sources that provide the bedrock of the historical dogma of Angkor. The Angkor case demonstrates how, in such context, historical and archaeological approaches remain complementary, despite their differences and incompatibilities to produce coherent interpretations.

[104] *Discussant*

Potts, Richard [10] see Brooks, Alison

Potts, Richard (Smithsonian Institution, Human Origins Program)

[215] *Alternating High- and Low-Climate Variability Provided a Context for Variability Selection in Pleistocene East Africa*
 The interaction of orbital insolation cycles offers a model of East African environment that predicts switching between high- and low-climate variability over the past 5 million years. The model implies repeated increases in landscape/resource instability and intervening periods of stability. It also predicts eight prolonged eras of intensified habitat variability in which faunal community restructuring and hominin evolutionary innovations are likely to have occurred, potentially by variability selection. The prediction of highly variable landscapes is confirmed by stratigraphic analyses

in the Olorgesailie, Olduvai, Turkana, and other East African basins. At Olorgesailie, for example, 70% (n=30) of basinwide landscape shifts, including large-scale lake/land oscillations, occurred in a 200,000-year interval of predicted high-climate variability, compared with 29% in the remaining 500,000 years of the Olorgesailie Formation (1.2-0.5 Ma). Integrated analysis of archeological and paleolandscape records at Olorgesailie illustrates (a) the adaptable responses of Acheulean hominins to landscape variability, and (b) the potential influence of prolonged high variability beginning ~356,000 years ago on the shift from Acheulean to Middle Stone Age. Collaboration with the National Museums of Kenya, and support by the Peter Buck Fund for Human Origins Research and the Ruth and Vernon Taylor Foundation, are gratefully acknowledged.

Poupart, Melanie [162] see Bisson, Michael

Powell, Shirley and Mark Varien (Crow Canyon Archaeological Center)

[67] *Establishing the Genetic Distinctiveness of Hopi Corn: A Collaboration between the Hopi Cultural Preservation Office and the Crow Canyon Archaeological Center*

The Crow Canyon Archaeological Center and the Hopi Cultural Preservation Office (HCPO), under the leadership of Leigh Kuwanwisiwma, are conducting a long-term research and education initiative known as the Pueblo Farming Project. As one part of this project, Crow Canyon and the HCPO entered into an agreement to establish a database of Hopi corn lines. Our project uses DNA single sequence repeat (SSR) markers to determine whether there are differences among four morphologically distinct Hopi corn lines, and between the Hopi corn and other known corn genomes. The analysis examines the genetic distinctiveness of the Hopi corn lines, and the HCPO and Crow Canyon anticipate that these data can be used to protect the corn as intellectual property of the Hopi Tribe and to answer questions about Hopi history and prehistory.

In this presentation we focus on the lengthy and complex process that provided the foundation for this unique and productive partnership. Additionally we use the resulting data to evaluate both archaeological and traditional Hopi interpretations of the processes that led to the cultural landscape that today we know as Hopi. Finally, we offer thoughts about new directions for this creative collaboration.

Power, Robert (Plant Foods in Hominin Dietary Ecology - MPI for Evolutionary Anthropology), Arlene Rosen (The University of Texas at Austin) and Dani Nadel (Zinman Institute of Archaeology, University of Haifa)

[162] *Phytolith analysis of Late Natufian site at Raqefet Cave in Mount Carmel, Israel*

Raqefet Cave is a Late Natufian site on Mount Carmel in northern Israel. Although information is accumulating through phytolith analysis on Natufian plant use, we still have limited information on the way Natufians availed of plants for subsistence and other cultural activities due to the rarity of Natufian macrobotanical remains. Here we report on the results of a preliminary study of phytoliths from sediments in the site's cave floor, carved bedrock features and burials. Some sediments revealed abundant and diverse phytolith morphotypes. These results may indicate the use of plants in both economic and symbolic behaviors by Late Natufians.

Powis, Terry [36] see Ward, Drew

Praetzellis, Adrian

[99] *Discussant*

Prascunas, Mary (WestLand Resources, Inc.), William Deaver (WestLand Resources, Inc.) and Fred Huntington (WestLand Resources, Inc.)

[130] *Food or Fiber: The Archaeology of Agave Processing in Southern Arizona*

Agave was an important source of food and fiber for most Native American groups living within its distributional range. Non-irrigation agricultural rock pile fields associated with agave cultivation have been identified at numerous localities across southern Arizona, and are generally associated with the middle and late Formative periods. Although the economic and social implications of subsistence- versus nonsubsistence-related agave processing are fundamentally different, the archaeological signatures of these activities are similar and few studies have attempted to differentiate between the two. This paper discusses potential methods for distinguishing between agave food and fiber processing, and describes the archaeology of what is interpreted to be an agave fiber processing locale associated with the Classic Period Marana Community in the northern Tucson Basin of southern Arizona.

Pratt, Trevor (CA Office of Historic Preservation)

[53] *Moderator*

Pratt, William and David Brown (University of Texas at Austin)

[178] *The Cocina Perdida Site: Archaeological Survey in the Western Piedmont of Ecuador*

Archaeological survey in the Malqui-Machay valley of western Cotopaxi province revealed a number of new sites from the late prehistoric and colonial periods, though the suspected Inka occupation remains poorly documented. While the late prehistoric period is still little understood, one small site yielded a single whole vessel that reveals much about the area's late inhabitants. The buried kitchen remnants at this site suggest that at least some occupants may have struggled to survive in this valley that today lies well off the beaten path.

Prebble, Matiu [274] see Whitau, Rose

Prentiss, Anna (University of Montana)

[120] *The Archaeology of Housepit 54 during the Colonial Period at Bridge River*

Housepit 54 at the Bridge River site (interior British Columbia), is the target of a multi-year archaeological research project funded primarily by the U.S. National Endowment for the Humanities. With approximately 13 superimposed anthropogenic floors, the housepit offers the opportunity for fine grained analysis of variability in complex hunter-gatherer-fisher organization in time and space. The 2012 excavations focused on the Colonial period occupation, likely dating to the early to middle 19th century C.E. This poster outlines the project and reviews results of excavations with a focus on stratigraphy, features, and dating. Conclusions are offered regarding occupation patterns.

[120] *Chair*

Prentiss, Anna [120] see Prentiss, Anna

Prescott, Catherine [186] see Bailey, David

Prescott, Christopher (University of Oslo)

[221] *Chair*

Prevosti, Francisco Juan [26] see Martin, Fabiana María

Prezzano, Susan [68] see Walker, Morgan

Prezzano, Susan

[264] *Landscape, Memory, and Archaeology in Northwestern Pennsylvania*

Three seasons of excavations along the Clarion River within the Allegheny National Forest in northwestern Pennsylvania revealed a complex multicomponent site ranging from an early twentieth century mill town to a series of Middle Archaic fishing encampments that date as early as 8000 BP. These excavations at the Millstone site united several stakeholders, including town and county officials, state and federal agencies, university academics, undergraduates, and local high school students in the recovery of the past in a region that has seen little archaeological investigations. The results not only contributed to archaeological knowledge but provided legitimacy to the growing perception by residents and project partners of the intrinsic value of the natural environment of the region that in the recent past had been the focus of intense resource extraction, deforestation, pollution, and depopulation. The excavations provided validity to an emotional attachment to the landscape by linking its present use to a perceived past.

Price, T. Douglas (University of Aarhus)

[17] *Migration to and from Teotihuacan: An Isotopic Perspective*

In the last two decades, new methods have appeared for directly assessing human movement in the past. Focused on dental enamel, these methods have employed isotopic ratios of strontium, oxygen, and sometimes lead to examine the mobility of the inhabitants of ancient Mesoamerica. A variety of studies have been conducted at Teotihuacán focused on both individuals and groups to assess questions such as migration and mobility with regard to age, sex, and status. In this presentation, examples of isotopic studies of migration using human remains from Mazapan, Oztoyohualco, Cueva del Pirul, the Moon Pyramid, the Temple of Quetzacoatlan, and elsewhere will be discussed in detail to document the utility of these methods. The results of these studies show a high degree of mobility in and around the Basin of Mexico during the Classic period.

[17] *Discussant*

Price, T. Douglas [37] see Cucina, Andrea

Price, Neil (University of Aberdeen)

[55] *Nine Paces from Hel: Time and Motion in Old Norse Funerary Drama*

The last decade or so has seen an increasing interest in the notion of performance and drama as integral elements in Viking-Age ritual. Among textual scholars, notably Terry Gunnell, we have seen great advances made in our understanding of how what we now know as Norse mythology was originally communicated and perceived. Archaeologists, including the presenter, have worked on the parallel realm of mortuary behavior and the complex practice of funerals. However, it is one thing to note the probable existence of ritual performance in these contexts, but a quite different matter to uncover what it was that actually happened. How were the postulated mythological dramas staged? Where did these plays find their audience? What really occurred at the gravesides of the Vikings? Using examples from the Old Norse prose corpus and recent archaeological finds, this paper will discuss the recovery of duration, spatial arena and specific action in performative ritual of the period.

[55] *Chair*

Price, Gypsy (University of Florida) and John Krigbaum (University of Florida)

- [136] *From Fields to Feast: Procurement and Consumption at Mycenae, Greece***
 The multivocality of food does not start at the dinner table or even in the kitchen, it begins with procurement. In the case of pastoralism, the management and distribution practices of fauna are part of the food signification process. Human-animal interactions of both managed herds and wild game impact the meaningfulness of the consumption of faunal resources. I present preliminary results of an isotopic survey of fauna from Petsas House, a Late Bronze Age extra-palatial industrial and domestic structure at Mycenae, Greece. Stable isotope biochemistry permits changes in diet and movement across landscapes to be assessed for individual fauna associated with populations exploited for food (sheep, goat, cattle, deer, and boar). Disparities in provisioning of foddering strategies, as well as place of origin or herd patterning are visible using multiple isotope proxies (carbon, oxygen, nitrogen, and strontium). This research addresses questions concerning the meaningfulness of locality or origin and degree and type of human interaction when procuring faunal resources, both wild and domestic, for consumption in various social contexts at Mycenae during the Late Bronze Age.

Prieto, Oscar Gabriel [101] see Sutter, Richard

Pritchard, Erin [276] see Harle, Michaelyn

Privat, Karen (University of New South Wales, Australia), Shawn Ross (University of New South Wales, Australia), Adela Sobotkova (University of New South Wales, Australia) and Victoria Russeva (Bulgarian Academy of Sciences)

- [217] *Paleodietary Analysis of Bronze Age Human Remains from Boyanovo, Bulgaria***
 The Bronze Age of the Eurasian steppe and border-steppe regions was a period of flux, with a tendency toward increased mobility for portions of communities or entire groups. The increasing economic dependence of humans upon their domestic herds in the Bronze Age and subsequent Iron Age is to some extent reflected in the archaeological evidence for a broad dietary shift toward the consumption of domesticated animal products over wild and agricultural resources. However, this trend is not uniform across the region, and paleodietary and paleoecological studies from a range of sites across the Eurasian steppe indicate that, at least at some sites, wild resources (e.g., fish) and agricultural resources (e.g., millet) contributed significantly to the diet of humans through the Bronze Age. In this study, we use stable isotope analysis of bone collagen extracted from 20 adults from the Bronze Age burial mound of Boyanovo in southeastern Bulgaria to examine dietary differentiation within the population (sex, age, outliers). The paleodietary trends identified are compared with comprehensive archaeological, osteological and botanical analyses from Boyanovo and other contemporary sites throughout the broader Eurasian steppe region to address issues of animal management, wild plant and animal exploitation, and social structure and mobility.

Prociuk, Nadya

- [259] *Inscribing Identity: Symbolic Representation in the Castro Culture***

The material remains of the Iron Age Castro Culture of northwestern Iberia display the repeated inscription of design motifs which distinguish them from surrounding groups. These designs appear to manifest a suite of symbolic concepts reflecting a sense of shared identification. Significantly, this set of symbolic identifications encountered the possibility of change at every re-inscription, perhaps reflecting fluid conceptions of identification. Though it may never be possible to accurately understand the meaning of the symbolic motifs to the Castro people, my research attempts to understand the social function of material culture repetitively

inscribed with symbolic motifs.

In order to explore this possibility, my research focuses on 5 important characteristics of these motifs: context, repetition, visibility, association and commonality. Utilizing collections of ceramics, items of personal adornment, as well as domestic and monumental architecture, it may be possible to access the ways in which the people of the Castro Culture chose to represent aspects of a shared identification. This paper will present the theoretical foundations and work in progress of this research project.

Prost, Stefan (Allan Wilson Centre for Molecular Ecology and Evolution, University of Otago, NZ), Andrew Clarke (School of Life Sciences, University of Warwick, Co), Olga Kardailsky (Department of Anatomy, University of Otago, Dunedin), David Addison (Samoaan Studies Institute, ASCC, American Samoa) and Lisa Matisoo-Smith (Allan Wilson Centre for Molecular Ecology and Evol)

- [47] *MtDNA and Y Chromosome Evidence for the Origins and Population History of Tokelau***

This study is part of National Geographic's Genographic project in association with the Tokelau Science Education and Research Project. We sampled cheek swabs and genealogical information from more than 150 individuals representing all three atolls: Atafu, Nukunono and Fakaofu. We sequenced complete mtDNA genomes and identified Y chromosome haplotypes to study population structure in the archipelago using standard and model-based analyses. We then compared the data to other Pacific populations. This paper presents those results and the implications for the origins and population history of the people of Tokelau.

Prufer, Keith [36] see Robinson, Mark

Prufer, Keith (University of New Mexico)

- [256] *A Multi-Proxy Regional Chronology for Southern Belize***

Southern Belize is a geographically circumscribed region and one of the more ecologically diverse in the Maya Lowlands. Political centers are located in range of geological and biotic settings from the igneous Maya Mountains to the Caribbean Sea. With occupation at over 20 minor capitals spanning at least 1000 years, it is an ideal area to study processes of state formation and regional interaction. This presentation discusses the regional settlement chronology drawing on primary and archival data including ceramics, radiocarbon assays, monument dates, architectural styles, and settlement patterns.

Pryor, Alex [274] see Ussher, Ella

Pugh, Timothy (Queens College and The Graduate Center), Carlos Sánchez (Centro Universitario de Petén), Evelyn Chan (Centro Universitario de Petén), Miriam Salas (Centro Universitario de Petén) and Pablo Lizano (Centro Universitario de Petén)

- [78] *The Late Preclassic Occupation at Tayasal, Petén, Guatemala***

Recent archaeological excavations at Tayasal, Petén, Guatemala have revealed that the site experienced its largest occupation during the Chicanel phase (300 BC-AD 200). At this time, a massive T-shaped platform was built in the site's center and in some areas, the fill of this platform is over 7 meters deep. Chicanel phase developments also include triadic temple groups and surrounding residences. Excavations encountered a circular platform, which likely dates to the Chicanel phase. The lack of substantial Early Classic (AD 200-600) period materials at Tayasal indicates a hiatus at the end of the Late Preclassic period (300 BC-AD 200). A similar pattern was encountered at other sites in the Petén lakes region suggesting the possibility of a major population shift and/or collapse in the area at the end of the

Preclassic period.

Pugh, Timothy [140] see Shiratori, Yuko

Pugh, Christina (Washington University in St Louis), Daniel Pugh (Nazarbayev University) and Zachary Cofran (Nazarbayev University)

[149] *Nazarbayev University Laboratory of Anthropological Sciences: New Resources for Steppe Archaeology*

The Eurasian steppe is home to a staggering amount of archaeological wealth, but it has received proportionally little attention from Western archaeologists. With a rapid pace of development in the former Soviet republics, particularly Kazakhstan, many archaeological treasures are at risk. The president of Kazakhstan has recently commissioned a novel university project in his name, and heritage management is prioritized in various forms. The Nazarbayev University Laboratory of Anthropological Sciences (NULAS) is establishing a 21st century program of heritage management with three primary areas of focus: 1) bringing modern techniques to the steppe; 2) facilitating transfer of knowledge between English speaking archaeologists and colleagues working in Russian, Kazakh, and other local languages; and 3) providing a point of cooperation and support for foreign archaeologists working in the region. This poster reports on the development of this new program and presents strategies for upcoming projects.

Pugh, Daniel (Nazarbayev University)

[278] *Climate and Culture: Late Prehistoric Social Flux in the Central Plains*

The mid-13th century saw major movements of population within, and more substantially out of, the Central Plains. The re-occupation of this territory over a century later set the social stage for the emergence of historically-known Plains tribes. Thus understanding exactly how and why these population shifts took place is critical for explaining the origins of the historic and modern tribes. Climatic models have often been invoked to explain the 13th century abandonment and by extension the later reoccupation, but several of the assumptions underlying those models have recently come into question and they deserve re-evaluation. Re-evaluating the respective roles of culture and climate in these population movements has implications for the cultural origins of historic tribes and the ways that archaeologists understand historical relatedness.

Punke, Michele (Archaeological Investigations Northwest, Inc.)

[33] *The Surveyor Spring Site: An Ash-Flow Tuff Obsidian Source in South-Central Oregon*

The Surveyor Spring archaeological site in southern Lake County, Oregon, is positioned on a landscape composed primarily of Pliocene- to Miocene-aged volcanic ash-flow tuffs. The tuff deposits are made up of indurated pyroclastic materials, including rhyolite, ash, pumice, and obsidian. The tuff deposits have weathered in place, revealing localized concentrations of obsidian nodules within the site. These obsidian concentrations served as an important raw material source for prehistoric people who lived in the area. This paper presents the complex geologic and geomorphic setting of this obsidian source, and discusses the nature of the site in relation to other obsidian-rich tuff deposits and archaeological sites in the area.

Punzo, Jose Luis (Instituto Nacional de Antropología e Historia)

[97] *The Chalchihuiteños, Dwellers of the Hills in the Valley of Guadiana Durango Mexico*

Around A.D. 600 in the Valley of Guadiana, south-central Durango, Mexico, a series of small villages began to appear on the summits of steep hills near the margins of rivers. This

occupation has been referred to as the Guadiana branch of the Chalchihuites culture with a deep Mesoamerican tradition. Many researchers have regarded these summit villages and their architecture, especially terraces and modified narrow passages to access the summit, as a defensive reaction to a violent time. However, a broader consideration shows that the architecture, patios, pyramids, and ball courts on these hills reflect a profound worldview of landscape, life, and ritual during this time.

Purcell, Gabrielle (The University of Tennessee)

[243] *The Development of Maize Agriculture in the Smoky Mountains*

Located in the Smoky Mountains of North Carolina, Smokemont is a multicomponent site that has evidence of occupation from the Early Woodland through Euro-American periods. Paleobotanical remains have been examined from two structures identified on the site, one Pisgah house and one Qualla house, as well as from Early and Middle Woodland features. Floral analysis of four Woodland pits indicates some horticultural activity, and wild plants continue to be important but supplementary to maize agriculture during the Mississippian and Cherokee occupations. This paper discusses the development of maize agriculture at Smokemont as indicated by plant remains collected in 2010 and 2012.

Purser, Margaret [111] see Wingard, John

Puseman, Kathryn [236] see Scott Cummings, Linda

Putsavage, Kathryn (University of Colorado)

[16] *Social Transformations in the Mimbres Region of Southern New Mexico from A.D. 1150 to 1450: An Investigation of the Black Mountain Site (LA 49)*

In the Mimbres region of southern New Mexico, the Black Mountain site (LA 49) is well-known but poorly understood because of long-term and extensive vandalism. Since the site is probably the largest post-Classic Mimbres pueblo in the Lower Mimbres Valley, research at the site could significantly add to current understandings of demographic and social transformations in the southern Southwest after A.D. 1130/1150. From 2010 to 2012, the University of Colorado conducted three seasons of field research examining two periods of social transformation at the Black Mountain site. The first period of transformation occurred around A.D. 1150 and represents the transition between the Classic Mimbres (A.D. 1000 to 1150) and Black Mountain phase (A.D. 1150 to 1250/1300). The second period of transformation represents the transition from the Black Mountain to the Cliff phase (A.D. 1250 to 1450). Both of these phase transitions encompass a range of transformative processes including population replacement and reorganization, changes in economic networks, adaptations to changing or new environments, and/or reorganization of social networks. The scale, chronology, and nature of these two transformations are not fully understood. This paper describes recent research at the Black Mountain site and provides new insight surrounding these complex social processes.

Putsavage, Kathryn [86] see Dolan, Sean

Pyburn, Anne (Indiana University)

[144] *Location, Location, Location: Population Movement and Maya Cities*

No single archaeological site in the Maya area has all of the characteristics that have been attributed to cities, but most authors agree that at least some Maya of the classic period were urban. While population distribution and density have often been considered in attempts to understand Maya settlements, population movement, other than exodus, has not been the focus of much research. We observe the movement of goods, we

speculate about the movement of people carrying them, but we have drawn few conclusions about how the sort of large scale migrations that affected early cities elsewhere in the ancient world might have played a role in Maya political economy. In this paper I consider what aspects of material culture, if any, may be considered an index of migration, and whether migration must be considered a significant factor in understanding the life histories of prehispanic Maya cities.

[118] *Moderator*

[100] *Discussant*

Pye, Mary (New World Archaeological Foundation)

[4] *Discussant*

Pyszka, Kimberly [119] see Falls, Eva

QIAN, Wei (University of Science and Technology Beijing)

[93] *Cast Iron Smelting in Early China: Archaeological Survey and Laboratory Simulation*

Cast iron is one of the most important inventions in ancient China. The white cast iron specimens found at Tianma-Qucun Cemetery in Shanxi Province dated to 8th c. B.C. showed the earliest use of cast iron in China. Dozens of pre-500 B.C., cast iron artifacts have been unearthed from sites in Yellow River and Yangtze River valleys. The invention of cast iron smelting was strongly related to the technology, as well as the social demands, of cast bronze and ceramics in early China. A series of iron smelting furnaces were surveyed and measured with scientific methods. 3D laser scanning technology was applied to measure the hearths and walls of the shaft furnaces which was useful in reconstructing the furnaces. The smelting situations in the furnaces can be simulated by using the calculations with CFD software and the analysis of the slag and other remains in the smelting sites. The spatial evolution of the smelting furnaces shows why the ancient Chinese could produce liquid cast iron so early and how they continued on this technical route for so long time.

Qin, Zhen (Washington University in St. Louis)

[183] *Studies of Iron Smelting Sites around Nanyang Basin during Warring States, Qin and Han Periods*

From the Warring States period to the Han dynasty (475 B.C.-220 A.D.), a series of distinctive cast-iron based smelting technologies, which differed from bloomery technology in the Near East and Europe, were invented and adopted in Central Plain of China. Several clusters of iron smelting sites were found and excavated in the region, especially around the Nanyang Basin. The studies on these sites will contribute to deeper understanding of some focused archaeological issues, including early smelting technologies, patterns of site locations and relationships between iron production and the environment.

This poster will first give a brief but comprehensive introduction to the archaeometallurgical work done around Nanyang Basin, especially on the smelting sites in Wugang and Xiping counties. Analyses of slags and iron products by SEM-EDS and metallurgical microscopy indicate that there was a complete system of iron production, including mining, smelting, melting and casting. Then in the poster, the author will show GIS-based spatial analyses of the distributional patterns of sites, which display that sites with different functions have evident divergences on slope and flow accumulation but identity on aspect. Finally, the interactions between smelting activities and ecology near the sites will be explored.

Quiggle, Robert (HDR Engineering, Inc.)

[270] *Developing Strategies for Managing Cultural Resources at Large Hydropower Projects: A Case Study from the U.S. Gulf Coast*

The management of archaeological and historic resources at large hydroelectric projects licensed by the Federal Energy Regulatory Commission presents unique challenges. Fluctuating reservoir levels, public recreation, and even routine maintenance activities all have the potential to adversely affect historic properties if proper management measures are not in place. This poster explores successful strategies for managing cultural resources at large hydroelectric projects through a case study of the Toledo Bend Project, a bi-state hydroelectric project on the U.S. Gulf Coast. With over 1,100 miles of shoreline, the Toledo Bend Project is one of the largest hydroelectric projects in the United States, and over 400 archaeological resources have been reported within the project's area of potential effects. Working on behalf of the licensees, HDR Engineering, Inc. led a diverse group that included the State Historic Preservation Officers, Indian tribes, and the U.S. Forest Service to develop a consensus Historic Properties Management Plan (HPMP) that will guide the management of archaeological and historic resources at the Toledo Bend Project for the next 50 years. The HPMP developed for this project serves as an example of how carefully considered management strategies can successfully balance preservation concerns with the efficient operation of large hydroelectric projects.

Quimby, Frank (Micronesian Area Research Center--Research Associate)

[95] *The Mariana Islands and the Role of Early Modern Asia-Pacific Colonization in Globalization*

The Marianas, a western Pacific archipelago astride the Manila Galleons' return voyage from Acapulco, were the first Islands of Oceania Spain integrated into its Asia-Pacific colonial trading network. The indigenous people, known as Chamorros, traded with Spanish and other Europeans in the 16th and 17th centuries, facilitating the reception of a Jesuit-led mission in 1668. Resistance to the colony's social transformation and political consolidation agenda led to the conquest of the islands, which became an official colony and way-station for Manila-bound galleons until 1815.

Quintus, Seth (University of Auckland)

[274] *Intensive Food Production Systems in the Samoan Archipelago: A Case Study from Ofu Island, Manu'a group*

Prehistoric food production systems in the Samoan archipelago have been referred to as non-intensive, based on historic era observation and little archaeology. However, more recent archaeological examinations on multiple islands of the group are calling this description into question, though no archaeological project has specifically examined food production. Research being conducted on Ofu Island, Manu'a, American Samoa, has this goal. Preliminary results suggest that swidden cultivation and multi-storey arboricultural gardens constitute the system complimented by landscape modifications in the form of ditches and terraces, the former densely distributed across the interior landscape. I argue that the impetus for the construction of these landscape modifications was multi-faceted, ditches, especially, functioning in different ways depending on both temporal and spatial context. While intensification models may be utilized to understand this system, a better understanding of the differences between this production system and systems elsewhere in Oceania requires an "unpacking" of the process.

R. Carl, DeMuth [188] see Wells, Joshua

Raad, Danielle (Massachusetts Institute of Technology) and

**Cheryl Makarewicz (Institute for Pre- and Protohistory,
Christian-Alb)**

[266] *The Exchange and Production of Stone Beads
at the Pre-Pottery Neolithic Site of El-Hemmeh,
Jordan*

The site of el-Hemmeh is a multi-PPN settlement located in central Jordan and associated with the agricultural transition in the Levant. El-Hemmeh boasts a diverse assemblage of stone beads, comprised of unworked raw material, bead blanks, and finished beads of a variety of shapes, sizes, and colors. Focusing on these stone beads affords the opportunity to geologically source material and identify objects that must have been imported along some stage of production. Drawing primarily from el-Hemmeh, yet including comparative data from contemporaneous nearby settlements, we are concertedly investigating the provenance of the stone, shifts in bead typology, and perforation methods. Variations in typology and manufacturing technique through the PPN as compared to other sites in the Levant may reveal a wider economy of stone beads. Does this exchange involve the transport of finished beads, raw material, or concepts? Do channels of material transfer map onto regularities in typology, or other trade routes such as that of obsidian? The stone bead analysis at el-Hemmeh adds another dimension to the broader flow of material and ideas occurring throughout the PPN Levant, reflective of broader cultural shifts and ideological trends associated with the spread of agriculture.

Radini, Anita [172] see Hardy, Karen

**Radini, Anita (PALAEO-The University of York, UK), Y.
Hancock (Physics, The University of York, UK), Efthymia
Nikita (Archaeology, Aristotle University of Thessaloniki),
Allan Hall (PALAEO-The University of York, UK) and Karen
Hardy (ICREA, Universidad Autonoma de Barcelona, Spain)**

[172] *The Challenge of the "Invisible Environment":
Micro-Debris in Human Dental Calculus as a
New Line of Evidence for Medieval Urban
Leicester (UK)*

The study of human dental calculus has recently been gaining popularity in bioarchaeology for its potential in providing new insight into palaeodiet and as a possible biomolecular reservoir. The human mouth is approached in this talk as a peculiar depositional environment, in which 'invisible' to naked eye microscopic debris of different nature (dust), originating from the environment surrounding the individual, is trapped. The 'invisible' organic and inorganic micro-debris that constitute dust can sometimes represent a health hazard, in the present as well as in the past. We discuss the challenges encountered in identifying this 'dust' at the microscope, together with ways of overcoming them. In doing so, we highlight the potential and limitations of this method by applying it to the calculus matrix of individuals from two Medieval cemeteries in the city of Leicester (UK). The correlation between the obtained data and osteoarchaeological parameters is explored in order to produce new insights into broad questions related to living conditions in the Middle Ages. Making these lines of evidence visible may allow a better understanding of the challenge that unhealthy 'dust', as invisible environment, has represented for past populations.

Radivojevic, Miljana (UCL Institute of Archaeology)

[93] *Inventing Metallurgy II: A Look through the
Microscope Lens*

Academic debates on the invention of metallurgy are dominated by the pursuit of when and where of the earliest copper metal smelting event. The recent study of the 7000 years old copper smelting evidence from a Serbian Vinča culture settlement revived the possibility of multiple, rather than single origins of metallurgy in Eurasia; however, little has been done to address the invention of metallurgy beyond the discussion of its exact time and location. This paper will discuss how and why metallurgy was invented by looking into choices and skills involved in selection, experimentation and processing of distinctively coloured copper

ores throughout ca. 2000 years in the Balkans. The 'microstructure' of a metal invention process is explored through optical, compositional and isotopic analyses of copper minerals, ores, slags, technical ceramics and metal artifacts coming from eight different Balkan settlements, dated from the late 7th to the late 5th millennium B.C. This research suggests a unique and independent technological trajectory of the emergence of metallurgy in the Balkans, which evolves from mono- to polymetallic within this period.

[93] *Chair*

Ragan, Elizabeth

[211] *The Ghosts of Kings: Sociopolitical Complexity
and Ethnogenesis at the Edge of Europe*

Kingship on the "Celtic Fringe" is a convoluted affair, as Bernard Wailes found at Dún Ailinne. Attempts to grasp insights through its political economy have often fallen short of expectations; in Argyll, the Dalriada Scots participated in early medieval trade networks that brought Mediterranean and Gaulish ceramics up the Irish Sea, but survey has failed to find sites that may have served as emporia similar to Tintagel in Cornwall or Dalkey Island near Dublin. Doubts have now been cast on interpretations of the Miniugud Senchasa Fher nAlban that claim the census and naval muster system it describes can be dated to the 7th century A.D. Amid perennial interest in the ethnogenesis of the Scots, perhaps it is time to reexamine the concept of state formation in the land that took its name from the Dalriada, and on the Highland ground that provided anthropologists with their original model for chiefdom-level societies.

Raharijaona, Victor (U of Fianarantsoa)

[223] *"Dirty" Politics and "Earthy" Poetics: Grounded
Subsistence and Grounds for Resistance in the
Highlands of Madagascar in the Nineteenth
Century*

The Malagasy poet, patriot and politician, Rabemananjara, wrote: "the virtue of the earth ceaselessly penetrates individuals as daily they walk the land with naked feet" (1970:56). "Earth" is and was a powerful icon/index of Malagasy identity and resistance to both indigenous and external colonization. The term "ny tany sy ny fanjakana" (the land and the rule) is the traditional designation for the "state" in Madagascar. I begin by examining the material, linguistic and conceptual crafting, in propaganda and projects, of the icon/index of "land" and the symbol of "rule" to meet the needs of one ruler to reunite and reshape the polity of Imerina (central highlands of Madagascar), and to subsequently envision an expansionist polity. I then examine the imposition of French colonial authority, with political complicity on the part of elite members of the earlier indigenous expansionist polity, focusing attention on elements of the physical presence of the French rule (fanjakana) on the landscape. I further examine the power of the indigenous concrete symbol of the "land", with attendant metaphors, to incite and "ground" Malagasy resistance, for more than 60 years, to both corrupt indigenous "rule" and externally imposed colonial presence on their land (tany).

Rahemtulla, Farid (Univ Northern British Columbia)

[137] *Modeling Coastal vs. Terrestrial Forager
Technological Organization in British Columbia*

In recent decades there has been a realization that coastal foragers organize their lithic technologies in ways that differ from those of their terrestrial counterparts. In general the expectation is that different constraints operate within these two situations, leading to potentially different types of raw material use, reduction strategies, recycling and stockpiling. For example consistent use of watercraft in coastal communities provides a different set of constraints on raw material access and transport, than in areas where primary movement is on foot. To explore this variability further a heuristic model is constructed to evaluate a number of constraints on lithic technological organization in coastal versus

terrestrial foragers in British Columbia. Modeling results are compared with archaeological data from these areas.

Raichlen, David [74] see Gosman, James

Railey, Jim (SWCA - Albuquerque)

[291] *Radiocarbon Dates and Long-Term Subsistence and Settlement Trends in Far Southeastern New Mexico*

There is an acute shortage of detailed subsistence and settlement data in far southeastern New Mexico, and this makes charting long-term trends here a challenging endeavor. Yet there are hundreds of radiocarbon dates for this region, and their frequency trend line reveals a very clear pattern. Specifically, radiocarbon frequencies rise dramatically toward the end of the Late Archaic period, with a prominent peak around A.D. 600-700, during the early portion of the Formative tradition. After that the frequency of dates falls off sharply, and continues a steady decline into historic times. The trend line suggests three broad developments. The first is rapid population growth, ubiquitous land use, and intensive plant-food utilization (involving abundant cooking pits containing datable charcoal) under favorable climatic conditions during the Late Archaic and earliest Formative. Second, mobility and land use contracted sharply with the onset of a severe drought in the tenth century, and the formation of "village" sites a bit later, resulting in a much less extensive distribution of datable contexts. Finally, following the abandonment of village sites and shift to nomadic bison hunting after A.D. 1450, low levels of plant-food collection translated into comparatively few cooking pits and, hence, very few datable contexts.

Rains Clauss, Lee

[165] *Discussant*

Rainville, Lynn

[284] *Mesopotamian Micro-Artifacts and Household Activities*

Fifteen years ago I began investigating the applicability of micro-archaeological techniques to better understanding domestic contexts in urban sites in Upper Mesopotamia. Unlike soil scientists, I define micro-artifacts as objects under 1 cm (as opposed to 1 mm). Archaeologists usually investigate activities by analyzing larger artifacts, features, and architecture. These analyses are limited by removal of artifacts upon site abandonment, poor preservation of features, and difficult-to-observe architectural modifications. Micro-artifacts, however, provide a unique window on activity areas because small items are more likely than larger ones to remain where they were dropped, lost, or produced.

My research originated as a study of household archaeology. It soon became clear that the excavation techniques commonly employed at urban sites were not adequate for recovering the ephemeral evidence from daily activities. Instead, I integrated archaeological, geological, and ethnographic techniques and developed a method that I refer to here as "micro-debris analysis." I apply this technique to a study of space in an Assyrian city, ancient Tushhan, modern-day Ziyaret Tepe. The results provide information about domestic technologies, craft specialization, and household activities. Together, these data allows us to create more accurate models to explain domestic economy and social organization in Upper Mesopotamian cities.

[30] *Discussant*

Rainville, Rebecca (University of Calgary)

[207] *Environmental Effects of the White River Tephra, Southern Yukon, Canada, and Their*

Implications for Human and Animal Populations in the Region: A High-Resolution, Multi-Proxy Study

The eastern lobe of the White River tephra was deposited approximately 1200 years ago over a 540 000 km² area extending from what is now eastern Alaska, USA, across much of the southern Yukon, Canada, and into the Northwest Territories, British Columbia, and Alberta, Canada. Anthropological, archaeological, and faunal evidence from the southern Yukon has suggested that the impact of this event on both human and animal populations was likely significant, however, very little is currently understood about the nature and duration of the tephra's environmental effects on the region. This poster presents the preliminary results of a high-resolution, multi-proxy study of the environmental effects of the deposition of the eastern lobe of the White River tephra in the southern Yukon, based on the analysis of pollen, larval chironomid (non-biting midge) head capsules, and sediment loss-on-ignition from a core of lake sediment. The combination of terrestrial and aquatic proxies of different types allows for new insights to be gained into the environmental consequences of the White River eruption, and provides valuable information for the interpretation of anthropological, archaeological, and faunal data from the region.

Rainwater, Christopher [193] see Warnasch, Scott

Rakita, Gordon (University of North Florida)

[286] *Discussant*

Ralph, Sarah (Skidmore College)

[228] *Hold Your Horses! Sacrificial Deposits of Horses in First Millennium B.C. France*

Humans share their social and cultural environments with a variety of animals and for a number of purposes. As well as serving an important economic function as a source of food and nutrition, animals can be used to express symbolic and ideological concepts. This paper investigates the spaces animals occupy in human socio-cultural worlds, particularly those relating to Iron Age 'Celtic' Europe (First Millennium B.C.). It will explore the symbolic and ideological aspects of human-animal relationships with specific reference to the horse. Within European Iron Age studies, animals have been shown to play an increasingly important role in society. They are often used as sacrificial offerings as part of rituals or accompany the deceased as funerary offerings. French Iron Age sanctuary sites have revealed evidence for the complex deposition of horses, particularly as multiple, articulated burials. This paper will discuss the differing nature of these deposits from selected sanctuary sites in France and the methodological implications of such deposits in terms of recognizing and analyzing animal sacrifice in the archaeological record of Iron Age Europe.

Ramadan, Tareq (Wayne State University Department of Anthropology) and Teddi J. Setzer (Wayne State University Department of Anthropology)

[158] *The Beautification of Death: An Example from a Late Nineteenth-Century Mausoleum in Pontiac, Michigan*

The "beautification of death" was a practice that transformed the way in which the dead were laid to rest. This concept was closely associated with nineteenth century European 'Romanticism' and brought about a social, cultural, and material transmutation that greatly affected the way in which people in Europe and the United States viewed death as well the preparation that went into burying the dead. Beautification is reflected in the choices of décor, in regard to the caskets, mausoleum, clothing and accessories interred with the deceased. This study presents the findings of this cultural practice as it pertains to one family mausoleum at the Oak Hill Cemetery in Pontiac, MI. Desecrated human remains and funerary items were collected

from the Southard family mausoleum by the Anthropology Department at Wayne State University during a restoration project at the cemetery. Wooden casket panels, metal hardware, glass, human remains, clothing, accessories and personal items interred with the dead were all recovered from the site. By analyzing these remains and historic documents, we are able to better understand who the individuals were in a socio-historical sense as well as what can be understood about funerary customs regarding late 19th century burials.

Ramirez, Jose Miguel [47] see Matisoo-Smith, Lisa

Ramon Celis, Pedro

[114]

Cambios en los ritos funerarios zapotecos durante el posclásico; retomando a Bernal y "los mixtecos y el valle de Oaxaca"

En el valle de Oaxaca existe una documentación de los ritos funerarios practicados por los grupos zapotecas desde el periodo Formativo temprano; este registro nos muestra que las prácticas mortuorias de este grupo en particular han sido constantes a lo largo del tiempo. Sin embargo durante el periodo Posclásico se han encontrado en distintos sitios arqueológicos evidencias de un cambio repentino en la construcción de las tumbas, y con ello se infiere un cambio en los ritos de enterramiento. En este escrito abordaremos una idea esbozada por el Dr. Ignacio Bernal sobre la influencia de los grupos mixtecos en el valle de Oaxaca durante el Posclásico, ya que esta discusión si bien se encuentra focalizada en los hallazgos cerámicos, otro tipo de vestigios como los arquitectónicos y funerarios deben de tomarse en cuenta. En este sentido haremos una comparativa de los distintos tipos de vestigios funerarios en varios estamentos sociales que se han documentado en la zona arqueológica de Yagul, para comentar sobre temas como etnidad e influencia.

[114]

Chair

Ramsey Ford, Dawn (HDR Engineering, Inc.)

[270]

Research Strategies for Large-Scale Cultural Resources Investigations: A Regional Perspective from the Sierra Nevada

HDR Engineering, Inc. has conducted several large-scale cultural resources investigations for hydroelectric projects in central and northern California along the western slopes of the Sierra Nevada. All of the projects consisted of large tracts of land, with some very challenging terrain which resulted in limited accessibility to site locations. As these hydroelectric projects are located along major rivers and tributaries that supported large prehistoric populations and were also the focus of mining activities during the Gold Rush, investigations of these areas identified hundreds of prehistoric and historic era sites. Examination of the distribution of sites from a regional perspective allows for the observations of trends that may elucidate variables pertaining to settlement patterns along major waterways. This poster will address some of these observable patterns over a large geographical landscape that may reveal both the effectiveness and deficiencies in previous research designs and aid in the development of more efficient research strategies for future projects.

[270]

Chair

Randall, Asa (University of Oklahoma)

[29]

The Geography of Innovation: How Jeffries Wyman Put Florida and Shell Mounds on the Map (1860–1875)

The state of Florida is an intermittent flashpoint of archaeological innovation, particularly regarding shell mound research. This process was initiated in the nineteenth century by Jeffries Wyman, whose 1875 publication “Fresh-Water Shell Mounds of the St. John’s River, Florida” highlighted stratigraphy, ceramic typology, zooarchaeology, regional survey, and other methods now commonplace to American archaeology. Beyond its status as a

historic footnote, Wyman’s contribution has structured successive research; his monograph remains an irreplaceable compendium of shell-bearing sites that have since been destroyed. Although Wyman’s innovation is often attributed to familiarity with the Scandinavian shell midden school, in this paper I examine how Wyman’s experience engaging with the archaeology and geography of northeast Florida structured his observations and interpretations. I employ GIS to reconstruct Wyman’s travels throughout the St. Johns River basin drawing on Wyman’s daily field journals between 1867 and 1874. Data including the location, duration, characteristics of his encampments, and nearby sites will be considered. By visualizing the how and where of Wyman’s field methods, this paper will consider why he emphasized certain sites and observations over others. The results have significance not only for local researchers, but anyone interested in incorporating early archaeological field work into contemporary research.

Randall, Asa R. [65] see Sassaman, Kenneth

Ranhorn, Kathryn (The George Washington University), Alison S. Brooks (The George Washington University/Smithsonian Inst), Fidelis Masao (University of Dar es Salaam) and John E. Yellen (The George Washington University/ Smithsonian Inst)

[11]

Preliminary Survey of the Middle Stone Age of Southeastern Tanzania

The origin and routes by which modern humans spread within Africa remain ambiguous, particularly in the intermediate regions between the better-known sites of South Africa and those of Kenya and Ethiopia. Current archaeological evidence indicates Middle Stone Age occupations in northern and central Tanzania at Magubike, Mumba, Nasera and other rock shelters, and in the Nduvu Beds at Olduvai Gorge, as well as at Karonga, Malawi and in the Lake Niassa region of northern Mozambique. Southeastern Tanzania, with woodland environments closer to those of central/southern Africa than to the Rift Valley and highland regions further north, remains relatively unexplored. Archaeological survey during the 2012 field season recorded 10 Middle Stone Age sites in the Mtwara, Lindi, and Ruvuma Districts of Tanzania near the border with Mozambique, including nine open air sites and one rock shelter. The predominantly flake-based assemblages include single- and multi-platform cores including classic Levallois cores, a micro-blade core, flake blades, and scrapers, mostly of quartzite and chert. MSA materials were commonly found in association with quartzite outcrops or near channel margins. Acheulian large cutting tools were absent and Later Stone Age artifacts were extremely rare, suggesting that the largest Pleistocene populations lived during the MSA.

Rasic, Jeff [130] see Shirar, Scott

Rasic, Jeffrey (National Park Service)

[168]

The Post-Excavation Use Lives of Fluted Projectile Points from Northwestern North America

Fluted projectile points are one of the most intensively researched classes of artifacts in American archaeology. This is especially true for the roughly 60 fluted points from Alaska, which have seen considerable research interest due to their location in Beringia astride one of the primary routes between Asia and the Americas. A recent synthetic study of all known fluted points from Alaska was undertaken and provides a useful case study highlighting the challenges and potential of collections based research, which are presented from the perspective of both researcher and curator. Alaskan fluted points have been collected over the past six decades almost exclusively from public lands and now reside in at least ten locations that include six museums or collections repositories, as well as laboratories, office buildings, and private residences. Specimens have been subject to a variety of treatments and analyses that include being sawn, cast, coated, and X-rayed, although documentation of these actions is

unfortunately spotty. All considered, the collections are in good condition. Less than five fluted points identified in site records and publications are missing or could not be located. The remaining specimens retain high research value and continue to yield new insights about early Americans.

[168] *Chair*

Raupp, Jason [73] see Gleason, Kelly

Rautman, Alison (Michigan State University)

[175] *Household, Community, and Circular Pueblos in the American Southwest*

Circular pueblos in the Southwest represent an unusual form of community layout. A small number are known from the Zuni area and also among the Eastern Pueblos. Probably the best-known archaeological example is Tyuonyi at Bandelier National Monument, but the Hispanic period pueblo of Gran Quivira at Salinas Pueblo Missions National Monument also includes a circular village that underlies the Spanish-era architecture. Interpreting the relationship between archaeologically observable village plan and the social context of the village has always been problematic, but archaeological studies of circular villages in Amazonia and the Southeastern United States suggest that circular village layout may develop in specific social contexts, such as a situation of regional demographic pressures and inter-village feuding. Recent research in the Salinas region of Central New Mexico provides new information about the demographic, political and economic context that will allow at least a partial test of these ideas in a re-examination of the social significance of the Gran Quivira circular pueblo as a social community.

Reale, Dayna (Cardno ENTRIX/Utah State University)

[278] *The Rise of Housepits in Archaic Wyoming: What Does It Mean?*

The archaeological record of the Sweetwater Arch, Wyoming spans nearly 12,000 years. Much of this record pertains to mobile hunter-gatherers who relied on large ungulates. A major change in settlement and subsistence signaled a shift in lifestyle within the region during the Archaic. Populations began living in housepits and exploiting local plant resources. To understand how, why and to what degree these changes occurred, it is necessary to look at the formation processes and structure of the sites themselves. These insights allow a glimpse of the changes in the behavior of hunter-gatherers during the Archaic. Examining site structure and formation processes of three housepits in the Sweetwater Arch will illuminate changes in settlement, subsistence, and social structure during the Archaic. The sites have been excavated and an analysis of recovered materials is underway. The spatial relationships of artifacts are being determined using a GIS. A size-sorting index and variance-to-mean ratio are also being employed to identify aspects of site structure. This study will examine the anticipated occupation, actual occupation, seasonality, refuse disposal, and group composition of each site. A comparison to regional housepit data provides understanding of the cause and degree of change in settlement and subsistence in Archaic Wyoming.

Reams, Erin [71] see Judd, Kathleen

Redding, Richard (Kelsey Museum, University of Michigan)

[56] *Meat for the Builders: The Animal Production System That Supported Pyramid Construction at Giza*

In a 2012 article I calculated that 10,000 workers at Giza consumed 105 cattle and 368 sheep-goats every 10 days. The size of the herds necessary to produce these animals is 21,900 cattle and 54,750 sheep-goats. These herds would have required

1204.5 square kilometers or about 5% of the Nile Delta land. The humans directly involved in herding numbered 18,980 or about 1.7% of the Old Kingdom population.

The questions I examine in this paper are: how close were the settlements; were they evenly spaced across the Nile Delta; where were they placed? I will present a model of animal producing settlements in the Nile Delta that can be tested in future surveys

Redman, Kimberly [152] see Greubel, Rand

Redmond, Elsa [56] see Spencer, Charles

Reed, Denne (University of Texas at Austin)

[10] *PaleoCore: A Data Integration Initiative for Prehistory*

This paper outlines the goals, conceptual structure, and technological framework of the PaleoCore project. PaleoCore seeks to develop a data standard for prehistory that will facilitate the exchange of primary occurrence data across prehistory research projects. Any standard, to be successful, must have support and input from the broad community of prehistory researchers and this is PaleoCore's first priority. Following the adoption of a standard, the PaleoCore initiative further aims to develop software tools that facilitate geospatial data collection and data management consistent with the standard. Finally, PaleoCore will promote the development of a federated network of prehistory geodatabases that researchers, students and the public can access through the web. This distributed network of data providers is modeled on the system developed by the Global Biodiversity Information Facility (GBIF) for biodiversity research. The synthesis and integration of primary data from multiple sources will open new avenues of big-picture integrative analyses of events in human prehistory and evolution.

[10] *Chair*

Reed, Denne [10] see Barr, William

Reed, Kaye (Institute of Human Origins / ASU) and Jason Kamilar (Midwestern University)

[215] *Using Mammals to Understand Dispersal Patterns of Hominins in the African Plio-Pleistocene*

The distribution and adaptations of mammals in Africa today is the product of historical circumstances, climate changes that affect vegetation patterns, and the adaptability of each species. By comparing the resultant distributions and adaptations of mammals across Africa today with those from the past, we can model probable dispersal routes of various groups of mammals, including hominins. Here we examine the mid-to-late Pliocene and the early-to-mid Pleistocene time periods to show patterns of mammal movement across the landscape compared with speciation and extinction events. We show that there are specific periods of dispersion and isolation in the Pliocene resulting in provinciality in both southern and eastern Africa for much of this time period. As a result of climate change, this provinciality dissipates near the beginning of the Pleistocene (2.5 Ma), and there is more evidence for mammal movement within and out of Africa. This is accompanied by a variety of new dietary and locomotor adaptations and a loss of others. These patterns are also reflected in the hominins that exist throughout those time periods.

Reeder-Myers, Leslie [70] see Willis, Lauren

Reedman, Amy [70] see Zutter, Cynthia

Reepmeyer, Christian (The Australian National University)

[181] *Modeling Social Interaction in the South-Western Pacific: A View from the Obsidian Sources in Northern Vanuatu*

This paper investigates the history of social interaction within communities in the Vanuatu Archipelago and between Vanuatu and other regions in the Western Pacific as reflected by variations in lithic raw material sources and the technology of stone artifacts. The combination of geochemical and technological data enables the application of theoretical frameworks using economic and theoretical ecology models with a particular focus on the 'value' of obsidian. Reviewing past approaches to the role of obsidian in social interaction, it is concluded that interpretations depending on neoclassical economic notions of the scarcity of resources in their evaluation of the concept of value are insufficient to explain patterns of spatial and temporal distribution of lithic artifacts. Alternative models are proposed that focuses on the importance of environmental factors, particular in relation to risk minimising strategies mitigating unpredictable resource outcomes.

[181] *Chair*

Reese, Kelsey (Washington State University), R. Kyle Bocinsky (Washington State University), Addy Donyina (University of Windsor), Donna Glowacki (University of Notre Dame) and Scott Ortman (Crow Canyon Archaeological Center)

[23] *What Are Communities, Really?*

Advances in agent-based modeling as a tool for archaeologists make it possible to craft models representing one or more social or spatial processes, which in turn generate expected distributions of archaeologically visible phenomena given some model. The Village Ecodynamics Project is producing models focusing on specific aspects of household interaction with the Southwestern landscape and on interactions among agents, either for reciprocal exchange, for barter, or under conditions of competition between social groups. These models produce spatial distributions of households that resemble, to a greater or lesser degree, the spatial distributions of households that archaeologists identify as "communities." The goodness of fit can then be assessed between the archaeological patterns—using the nearly complete survey coverage of Mesa Verde National Park—and communities generated by the VEP simulation, in which agents make roughly optimal decisions about agriculture, hunting, and resource exchange. We describe our procedures for inferring presence of communities in the real archaeological record, and examine the goodness of fit between that record and the communities generated through simulation to make progress on the question, "What are communities, really?"

Reese-Taylor, Kathryn

[171] *Discussant*

Reeves, Tiffany [181] see Popelka-Filcoff, Rachel

Regert, Martine [39] see Bellot-Gurlet, Ludovic

Regnier, Amanda [34] see Lockhart, Jami

Rehren, Thilo (UCL Qatar)

[93] *Inventing Technical Ceramics*

Technical Ceramics play a central role in most high-temperature processes, including metallurgy, the production of pigments, glass and glazes, and of pottery. They are used to build furnaces and kilns, to melt glass and metal, to cast and receive liquid metal, and to provide a controlled atmosphere at temperatures reaching from 500 to 1600 °C. Performance parameters include thermal and

chemical refractoriness, as well as permeability for liquids and gases, and are closely related to the physical and chemical composition of the ceramics.

Invention and subsequent adoption of TCs develop in close interaction between the crafts involved, following a two-way process of demand and availability driving development. Basic requirements for processing most early metals and alloys were met by ordinarily available raw materials, although their specific preparation and design for use indicate initially more innovation than invention taking place. Few real inventions are recognized, with the bulk of development apparently occurring incrementally. This talk will discuss three examples of real invention in technical ceramics production in pre-literate societies, including the selection of unusual raw materials for chemically and thermally refractory vessels, and experimentation with the heating mode in response to specific performance requirements.

Reiczyk, Ella [162] see Rosen, Arlene

Reid, Jefferson (University of Arizona)

[175] *The Rapidly Evolving Household: Episodic Change at Chodistaas and Grasshopper Pueblos, Arizona*

This paper summarizes the rapid, tree-ring-dated changes in the household that took place from the occupation of Chodistaas Pueblo (1263-1290s) to early Grasshopper Pueblo (1300-1330/1350) to late Grasshopper (1330/1350-1400). Some of the social processes implicated in these shifts include ethnic coresidence, the developmental cycle of domestic groups, and differential residential mobility.

[64] *Discussant*

Reid, Kenneth (Idaho State Historical Society)

[177] *Wait and Parry: Material Evidence for Hunter-Gatherer Defensive Measures in the Intermountain West*

"It is easier to hold ground than take it," wrote Clausewitz. The advantages of defense over offense were also recognized by hunter-gatherers in the Intermountain West. Fortunately, the evidence for defensive activity is easier to recognize archaeologically. Apart from skeletal trauma, a range of underutilized sources -- local histories, memoirs, and reminiscences, reports of military participant-observers and survey-parties -- as well as native testimony recorded by pre-professional ethnographers, confirms that contact-era hunter-gatherers in the Intermountain West often resorted to war, feud, murder, and intimidation. However, defensive measures relating to earlier periods of collective violence seem to reflect warfare proper, not segmental feuding or homicide. The societies in question probably fought to deny or seize key resources during periods of scarcity. Material traces of defended borders, fixed positions, and protective measures include buffer zones; sanctuaried heights and islands; parapeted entrenchments; earth-and-log bunkers; palisaded settlements; bermed rockshelters; missile-proofed house walls; settlement plans integrating overview, intervisibility, and soundscape; camp/village dog packs; fortified winter raiding bases deep inside hostile country; use of natural wetland and undergrowth patterns to constrain movement and fields of fire; and self-protection in the form of iconic evidence for shields, and mortuary clues suggesting surplus production of elk-leather cuirasses.

Reider, Kevin [94] see Hoffman, Brian

Reindel, Markus [214] see Isla, Johny

Reindel, Markus (German Archaeological Institute, Bonn, Germany) and Johny Isla

- [214] *Coast-Highland Interaction of the Nasca Society in the Palpa Region, South of Peru***
Recent investigations of the Nasca-Palpa project have revealed the strong presence of Nasca sites in the highlands of the Palpa valleys. These sites interacted intensively with the sites of the coast. In the initial developments the Nasca society received a considerable input from the highlands. After a period of florescence on the coast and due to climatic changes, settlement centers shifted from the coast to the middle reaches of the valleys. Nasca settlements in the highlands increased significantly. The decline of the Nasca society was followed by the incursion of the Wari culture on the western slope of the Andes.

Reineke, Robin [121] see De Leon, Jason

Reinhard, Karl [272] see Arriaza, Bernardo

Reinhardt, Eduard [83] see Boyce, Joe

Reinhardt, Eduard (McMaster University) and Joseph Boyce (McMaster University)

- [162] *Tsunamigenic Destruction of Herod the Great's Harbor at Caesarea, Israel: New Evidence***
The destruction of Herod The Great's Harbor at Caesarea, Israel has been controversial. The harbor was constructed in 21 B.C. and various theories have been proposed regarding how long the harbor was functioning and how it was destroyed, which vary from a slow decline to rapid destruction by earthquake and/or tsunami. Recent geological research indicates that several tsunamis struck the Israeli coast after the harbor was built and likely affected the harbor, however, the direct effects on the harbor structure have been difficult to assess due to a lack of documented modern examples. Recent research on the March 11th 2011 Tohoku-oki tsunami and its effect on harbor structures of California provides important evidence for identification of tsunami scour and deposition in Caesarea's archaeological record. Stratigraphic data collected over nearly 25 years of excavation in the ancient harbor show similar patterns of scour and offsets in the harbor moles compared to those found in California. This new comparative data from California proves that Caesarea was severely damaged by successive tsunami events in A.D. 115 and 551 as previously proposed.

Reitsema, Laurie and Victor D. Thompson (University of Georgia)

- [38] *Large-Scale Fourier Transform Infrared Spectroscopy Assessment of Bone Mineral Quality in Poland: Towards an Acceptable Range***
Fourier transform infrared (FTIR) spectroscopy is one of the few methods available for evaluating diagenesis of bone and tooth carbonates used for stable isotope analyses. However, there are no universally accepted parameters delineating "acceptable" and "unacceptable" preservation ranges. Sparse, previously reported FTIR values show considerable variation within sites and are inconsistent with other, parallel diagenesis indicators, including stable oxygen isotope ratios and carbon and nitrogen content of collagen. In an effort to develop cut-off parameters for sample degradation and to better explain FTIR variation, crystallinity and carbonate content of 150 human bones from Roman-era (2nd c. A.D.) and medieval (11th – 14th c. A.D.) Poland are reported and compared to other quality indicators. In the case of FTIR, spatial clustering of values is likely geochemically meaningful, therefore we also consider bone quality indicators in relation to burial location with GIS. Finally, we examine whether burial in coffins offers any protection from diagenetic alteration. Significant relationships between FTIR indices and (1) site antiquity, (2) within-site burial location, and (3) skeletal completeness are identified and discussed. Although currently FTIR indices are only

reliable as exclusion criteria in the case of extreme outliers, relationships such as these may help establish site-specific cut-off ranges.

Relaki, Maria [288] see Kilikoglou, Vassilis

Rengifo, Carlos (University of East Anglia)

- [59] *Shaping Local and Regional Identities: The Artisans of the Moche Period, Peru***
Moche craft production has traditionally been approached from a monolithic model. Current studies, however, consider the Moche as a set of heterogeneous social units with varying degrees of cohesion and fragmentation. This paper discusses how this new paradigm questions the passive role conventionally attributed to producers. It explores and compares the cases of workshops and graves from Huacas de Moche, San Jose de Moro, and Cerro Castillo, the latter a pluri-ethnic settlement in the Nepeña Valley. The paper examines pottery styles, and other aspects of material culture to suggest that the production and circulation of both symbolic and utilitarian artifacts can be seen as expressions of deliberate political actions made by artisans that sought to reinforce, deny, or contest a number of competing identities.

Rennaker, Patrick and Patrick McCutcheon (Central Washington University)

- [70] *Macro-Botanical Recovery Rates Using Flotation of Sediments from the Sunrise Ridge Borrow Pit Site***

The paleoethnobotany literature on recovering macro-botanical remains from archaeological sites suggests that the pre-treatment of floatation sediment samples will affect recovery rates. In order to determine the best approach at the Sunrise Ridge Borrow Pit Site (45PI408) we conducted a set of experiments with comparable samples of freshly excavated sediment. This site has a diverse set of features that contain large amounts of visible plant remains. Knowing which recovery technique will produce the best identification rates will greatly facilitate comparisons. We collected 13 four-liter samples of freshly excavated sediment during the summer of 2012. Each freshly excavated sample was split into 4 one-liter samples, one of which was immediately processed in a flotation tank. Two samples were dried, one to be floated after drying and the other to be gently dry sieved through a nested screen stack. Preliminary results show that samples sent through the nested screens recover greater amounts of charcoal compared to either of the floated samples (fresh and dried). Alternatively, the recovery of charred seeds is greater using the flotation system. These results are discussed in relation to the amount of time it takes to process the samples.

Rutherford, Tyler (Washington State University) and William Andrefsky, Jr.

- [150] *Distinguishing between Debitage Caused by Natural Impact and Intentional Human Activity***

A problem facing many archaeologists is the accurate identification of human produced, as opposed to naturally occurring, lithic artifacts. This is especially true in the case of highly contentious claims of sites predating Clovis occupation, many of which are defined by their seemingly simplistic lithic assemblages which are often critiqued as natural, rather than human produced, assemblages. Rather than focus on a qualitative, untestable, case-by-case analysis of such lithic assemblages, a quantitative experimental approach is taken here, attempting to replicate gravity-caused natural flaking under a variety of conditions. Experiments are conducted which assess brittle solid fracture based upon: 1) impact force-height and weight drops, 2) impact surface-relative consolidation, and 3) raw material differences-chert and obsidian. The resultingdebitage is then analyzed at the assemblage-level and compared to a sample of debitage from an archaeological context. The site used for comparison is an archaic residential site featuring pit-houses in

Southeastern Oregon, containing both obsidian and chert debitage. A quantitative analysis of simple, easily replicable attributes of the two debitage assemblages is conducted in order to determine if debitage analysis alone is sufficient to distinguish between gravity-produced natural flakes and intentionally created human debitage.

Reyes, Omar [26] see Méndez Melgar, César

Reynolds, Joseph

[13] *One Small Step: An Analysis of International Space Law and How It Effects Historic Preservation*

From 1969 to 1972 NASA's Apollo astronauts completed six separate lunar landing missions, creating historically significant sites that now sit frozen in the lunar desert. These sites represent what was a new frontier for scientific possibility, pushing the boundaries of human exploration hundreds of thousands of miles farther than it had ever gone before. A half a century later, these unique sites and their surrounding environments create a new opportunity for archeologists and preservationists alike. As one of the pinnacles of human scientific achievement, on par with humankind's greatest works of engineering, art, architecture, and science, these sites warrant the protection granted to any other site of historic importance. Although protection of these sites is complicated, due to their location on the Moon, it is possible. This paper explains how the myriad of conventions and treaties that govern the lunar surface interact with national and international preservation laws, as well as discusses earth-bound sites that exist in similar legal grey areas but have been protected through National Historic Landmark or World Heritage Listing status because of their significance to humankind.

Reynolds, Andrew

[55] *Funerary Drama in the Early Middle Ages*

This paper will introduce the session, and present a case study that examines the potential for reconstructing funerary drama in the realm of judicial and punitive killings. Often characterized as hasty and careless, many burials that fit into this broad category can be found to exhibit indications of prolonged and ritualized treatment. A range of burials from England and Scandinavia is presented with a focus on both the treatment of the body and its landscape context. Performance is suggested to have multiple meanings and timescales, which relate to chronological and geographical proximity to individual death and burial events.

[55] *Chair*

Reynolds, Ron 'Doc' [165] see Guilfoyle, David

Rhee, Song Nai [289] see Shin, SookChung

Rhode, David (Desert Research Institute) and P. Jeffrey Brantingham (University of California, Los Angeles)

[291] *Mind the Gaps: Testing Possible Hiatuses in Radiocarbon Dating Sequences*

Summed regional radiocarbon age data typically show periods containing abundant age estimates ('peaks') and periods containing few or no age estimates ('gaps'), often thought to reflect varying occupation intensity over the sequence in question. However, non-representative sampling of dated occupations may introduce significant biases in the observed magnitudes and durations of peaks and gaps, relative to actual occupational intensity. Here we ask, under what conditions can specific gaps in summed radiocarbon sequences be considered as valid occupation hiatuses? Data sets from the Qinghai Lake Basin, western China, and Bonneville Basin, western United States, are used as examples.

Rhodes, Jill, Barbara A. Omay (Drew University) and Joesph B. Mountjoy (Universidad de Guadalajara, Centro Universitario d)

[38] *Brief Lives: Childhood Mortality and the Bioarchaeology of West Mexico*

This contribution presents a look into the brief lives of children in the Late Formative period (200 B.C. – 200 A.D.) shaft and chamber tomb culture of West Mexico. While juveniles are generally underrepresented in Mesoamerican skeletal samples during the periods of increased social and agricultural complexity, a high level of childhood mortality was identified from the site of La Bolita, in Jalisco. Eight of 20 interments (40%) fall within the juvenile classification with the majority categorized as 'child' (2-12 yr). This stands in contrast to previous analyses begging the question 'Are children dying more frequently at La Bolita?' Is there an increased frailty (susceptibility to illness) in children from this site or are juveniles finally being represented in the burial assemblages? Cross-cultural comparisons are made to examine mortality profiles and look towards indicators of health, nutrition and disease for answers. Previous analysis of Late Formative shaft and chamber tomb culture indicated a socio-economically stable, egalitarian society without the burden of nutritional deficiencies impacting overall health. What is different at La Bolita? Increased frailty at La Bolita is supported by the higher prevalence of enamel hypoplastic defects, markers of nutritional stress and physical illness, in both the adult and juvenile remains.

Rhodes, Jill [38] see Omay, Barbara

Ricci, Olivia [224] see Araujo, Astolfo

Rice, Jennifer [41] see Mauldin, Raymond

Rice, Omar (California State Long Beach), Omar Rice (California State Long Beach), Erik Wintz (California State Long Beach) and Sachiko Sakai (University of California Santa Barbara)

[186] *Application of Portable XRF to Investigate the Source of Obsidian Artifacts in Mt. Trumbull in the American Southwest*

This poster focuses on investigation of source of obsidian artifacts found in Mt. Trumbull in northern Arizona. The goal of this study is to understand the evolution of social interaction pattern observed in distribution of obsidian artifact among the small scale societies in the marginal environmental settings. Obsidian artifacts are found in various sites in Mt. Trumbull from their early occupation, although the number of artifacts found is very small. There is no obsidian source adjacent to Mt. Trumbull. Thus, investigation of source of obsidian artifacts provides the better understanding of people interaction pattern in Mt. Trumbull through trading, migration or sporadic visit from outside areas. We will use portable XRF to investigate the source of obsidian artifacts. Specifically, we will ask the questions; (1) how many sources were involved in the obsidian artifacts found various sites in Mt. Trumbull, and (2) any distinctive distribution patterns are observed in different areas in Mt. Trumbull. Comparing to a few obsidian artifacts with known source information from previous studies, we will also determine where the potential source of obsidian artifacts.

Rich, Michelle [63] see Freidel, David

Richards, Michael [5] see Wong, Megan

Richards, John (University of Wisconsin - Milwaukee)

[25] *Ceramic Paste Composition at Cahokia and Aztalan: A Comparison Using Portable X-ray*

Fluorescence and Ceramic Petrography

This paper reports results of a compositional analysis of Mississippian period ceramic assemblages from the Cahokia site in southern Illinois and the Aztalan site in southeast Wisconsin. Data on elemental composition of sherds and clays was collected using a Bruker Tracer IIIv+ portable X-ray fluorescence analyzer (pXRF). Mineralogical and petrographic data was obtained from examination of selected ceramic thin sections. The resulting complementary data set supports earlier studies suggesting that some of the Mississippian vessels from Aztalan were manufactured from clays similar to American Bottom sources. Additionally, these data are used to explore issues relating to the nature of social relations between and among elements of the Cahokia populace and Aztalan's Mississippian and Late Woodland residents.

[25] *Chair*

Richards, Patricia (University of Wisconsin-Milwaukee)

[25] *Belgian Brickworks on the Door Peninsula: A Preliminary Compositional and Spatial Analysis of Hand-Molded Bricks from the Vandermissen Brickworks*

In October of 1871, a devastating fire, known as the Peshtigo Fire, destroyed 1,000,000 acres of farms, forests, sawmills, and small towns in Wisconsin and Upper Michigan including many of the Belgian farms and small towns along the west side of the Door Peninsula of Wisconsin. The Belgians rebuilt after the fire using bricks instead of logs for construction. A household brick making industry developed to produce the bricks. Many of these distinctive red brick structures survive today and give the region its architectural character. Local brickworks would have been very common during the rebuilding period following the Peshtigo Fire. However, very few are documented archaeologically. Archaeological investigations at the Vandermissen Brickworks, a late 19th and early 20th century brickworks, has recovered evidence of the steps typically associated with the process of hand-making bricks. A portable X-ray fluorescence (pXRF) analyzer was used in an attempt to associate extant structures with bricks produced at Vandermissen. PXRF data from a sample of bricks recovered from the site was compared to readings taken from a sample of red brick standing structures in southern Door County. Results were correlated with land use histories to discuss post-fire rebuilding strategies by the Door County Belgian community.

[25] *Chair*

Richards, Katie (Brigham Young University), James Allison (Brigham Young University), Richard Talbot (Brigham Young University), Scott Ure (Brigham Young University) and Lindsay Johansson (Brigham Young University)

[175] *Household Variation, Public Architecture, and the Organization of Fremont Communities*

The Fremont were small scale agriculturalists spread across the northern Colorado Plateau and eastern Great Basin from before A.D. 400 until the A.D. 1300s. Fremont residences are typically pit structures—although late adobe surface structures do occur—established as individual farmsteads, small hamlets, and villages of variable size, the largest with hundreds of occupants. In this paper we discuss how Fremont society was variably organized through time and space, including as households, communities, and dispersed communities. We describe architectural forms that denote not only residential, but also public, communal, and ritual functions. We then present a preliminary model of Fremont organizational strategies relative to social and environmental contexts.

Richardson, James (University of Pittsburgh and Carnegie Museum)

[285] *In the Wake of Kon Tiki: Sailing Capabilities of*

Andean Watercraft and Precolumbian Contact between the Andes and Polynesia

It is clear that by A.D. 1000 there was cultural contact between the Andes and Polynesia as evidenced by the introduction of the sweet potato and bottle gourd into the Pacific and the Asian chicken to Chile. The current theory on the how these domesticates arrived in Polynesia and Chile stresses Polynesian navigators delivering and picking up them up along the Andean coast. Little attention has been given to Andean mariners as the agent of delivery. This paper will focus on the evidence for Andean ocean going watercraft through the examination of the introduction of metallurgy to West Mexico after A.D. 600 from northern Peru and Ecuador, the archaeological evidence for Moche balsa rafts and double decked totora reed boats after A.D. 100, and the recent finds at the Huaca las Balsas at Tucume, Peru, of a raft with a sail dating to A.D. 1000. This data is presented to support the conclusion that Andean mariners were fully capable of long distance ocean voyages into the Pacific and could have introduced the domesticates to the Polynesians bringing chickens to the Andes on their return voyages.

Richardson-Cline, Krista and Jessica Normoyle (Northern Arizona University)

[182] *Curation Crisis: Changing the Way Archaeologist Work*

The curation crisis present in US museums requires archaeologists to discuss potential solutions. Museums are currently unstable institutions, passing their expanding collections to future generations. The present study contributes to the debate on museum collecting and disposal, using as a starting point the results of a survey that demonstrates museums are collecting at significant rates and curators are not using disposal as a collection management tool. Moreover, a review of frameworks underneath museum collections challenges the notion that museums function as repositories. In addition, the work conducted suggests solutions to the curation problem with the use of improved technology, changes in the way archaeologists operate in the field, and large-scale standardization programs.

Richter, Kim [253] see Fischer, Christian

Rick, Torben [70] see Willis, Lauren

Rick, John (Stanford University)

[180] *Canals, Sacrifice, and Water Ritualism at Chavín de Huantar, Peru*

The Middle and Late Formative periods (1200-500 BC) at Chavín de Huantar, Peru witnessed the development of elaborate underground spaces, both galleries and canals, whose use has remained somewhat unclear until the present. Recent extensive fieldwork, intended to both investigate these contexts, and also to return to the canal system one of its functions – drainage – has also provided consistent and clear evidence for the use of canals in ritual sacrifice. The Chavín canal systems have proved to be very extensive, involving both water supply and drainage, as well as deposit of sacrificed ceramics and other materials, and the apparent movement of ritual personnel. This sophisticated canal use, involving extensive manipulation of water, illustrates innovation in hydraulic technology in the service of ritualism. The development of canal use at Chavín is one of many examples of how Andean formative ritual centers served in the development of many technologies, islands of change within a relatively conservative agrarian hinterland.

[291] *Discussant*

[180] *Chair*

Rick, Torben (Smithsonian Institution), Patrick Kirch (University of California), Jon Erlandson (University of

Oregon) and Scott Fitzpatrick (University of Oregon)

[283] *Islands of Change: Archaeology and Human Ecodynamics on Islands*

Island ecosystems and peoples face uncertain futures in the wake of predicted Anthropocene climate change, sea level rise, and habitat alteration. Archaeological and paleoecological analysis of tropical Polynesia, the Caribbean, and California suggests that human impacts on islands extend deep in the human past, often beginning at initial settlement. There are important issues of scale and island physical characteristics, however, that cause human ecodynamics on islands to vary through space and time. These data provide important context for understanding human domination of earth's ecosystems and help inform modern environmental issues, including extinction, invasive species ecology, habitat degradation, and climate change.

Riede, Felix (Aarhus University (Archaeology))

[131] *The Laacher See Eruption (12920 BP) and Societal Change in Late Glacial Northern Europe*

Around 12.920 B.P. the Laacher See volcano erupted catastrophically. With an eruption column an estimated 40 km high, this eruption sent volcanic ash (=tephra) across a wide swath of Europe, from Italy in the south to the Baltic Sea region in the north. This paper explores how this eruption affected contemporaneous human societies by investigating a multitude of empirical strands. Remarkably, the Laacher See eruption appears to have led to the emergence of the first quasi-indigenous Scandinavian Stone Age culture, the so-called Bromme culture. This techno-complex differs markedly from its neighbours in a range of characteristics – tight territorial circumscription, the loss of bow-and-arrow technology, and a simplified flint technology – and it goes strongly against the grain of general cultural trends in this period. The origin and fate of the Bromme culture thus require special explanation. Hypotheses about possible links between the Laacher See eruption, its tephra fallout and plant, animal and human communities center on the ecological impact of this eruption at varying temporal scales. At the same time, the suggested long-term influence of this eruption on contemporaneous foragers can only be fully explained with reference to intrinsic social and network dynamics that go beyond ecological mechanisms.

[131] *Discussant*

[131] *Chair*

Riegel, Daniel (Radford University)

[149] *A Study of Ceramics from Prehistoric Native American Sites and Geochemical Composition*

X-ray fluorescence will be used for measuring the geochemical composition of ceramics from multiple Woodland period sites in Virginia to determine if the geographic location is a predictor of geochemical composition. It is hypothesized that each site will create a distinct group in the discriminant analysis results, and that these groups reflect the optimized resource gathering by the inhabitants of these sites. To test this hypothesis a Niton XL3t 600 Series XRF Analyzer with the XL3 portable test stand will be used to obtain the geochemical composition of the sherds from each site, as well as the geochemical composition of nearby clay resources. It is expected that the sherds from a site and its nearest clay source will be geochemically similar to one another, and thus that the inhabitants of each site used the resources closest at hand rather than searching far afield for their clay source. If this expectation is not met other hypotheses will be explored.

Riel-Salvatore, Julien (University of Colorado Denver) and Fabio Negrino (ISCUM - Istituto di Storia per la Cultura Material)

[28] *Lithic Technology, Mobility, and Human Niche Construction in Early Upper Paleolithic Italy*

The site of Riparo Bombrini, a collapsed rock shelter on the Ligurian coast of NW Italy, provides a robust data set to evaluate how the first modern humans in the region organized their lithic technology against a background of climatic volatility. This study focuses on the intersection between technological organization and mobility strategies in the two proto-Aurignacian levels at Bombrini. After establishing that the two occupations correspond to distinct mobility strategies, we present an overview of the technological specificities these imposed on the broader proto-Aurignacian technological repertoire. This is complemented by an analysis of raw material management in the two phases, which opens up a discussion of how mobility strategies articulated with different degrees of landscape knowledge. The transfer of non-local lithic raw material types over long distances is then interpreted as an instance of human niche construction designed to 'improve' the landscape early modern humans encountered as they settled Liguria and neighboring regions. We close with a synthetic overview of how the intersection between environmental change and lithic technology cannot be decoupled from a realization that, in most cases, environments are purposefully humanized to enhance the returns of specific behavioral strategies.

[212] *Discussant*

Rieth, Timothy (IARII)

[27] *Reanalysis of the Earliest Deposits in American Samoa using Bayesian and Age-Depth Models*

At the eastern extent of the Lapita expansion into Remote Oceania, archaeological research in Samoa has documented an anomalous pattern of early settlement for the Fiji/West Polynesia region. Unlike other islands in the area, a single Lapita deposit has been identified for the archipelago. An ever-increasing number of Polynesian plainware deposits have been recorded, particularly in American Samoa, but with few exceptions these deposits post-date Lapita by several centuries. The exceptions consist of deposits from 'Aoa (Tutuila Island), Vainu'u (Tutuila Island), and To'aga (Ofu Island). These three stratified archaeological deposits have produced radiocarbon dates that suggest an overlap with the accepted temporal range for Lapita in the region, yet the associated ceramic assemblages lack dentate stamped decoration and early vessel forms. We have used Bayesian and age-depth models to refine the chronologies for these deposits to assess 1) for outlier dates skewing the sequences, 2) whether there is a degree of overlap with the Lapita sequence, and 3) how the revised chronologies fit with a model that proposes limited occupation of the archipelago for several centuries post-Lapita.

[27] *Chair*

Rieth, Timothy [27] see Commandador, Amy

Riggs, Charles

[64] *Opening Remarks: The View from the Back of the Line*

From 1963 to 1992, the University of Arizona Archaeological Field School at Grasshopper trained more than 500 graduate and undergraduate students in archaeological field methods. Many of these students later joined the staff to pursue a variety of research questions as graduate assistants. Many also went on to distinguished careers in archaeology working all over the globe, from the Near East, to Central and South America, to the Pacific and, of course, to the Southwest. It is difficult to measure the totality of the influence of Grasshopper, as a number of these former students and staff members went on to run their own field schools and to train subsequent generations of students. Those of us who were there can reflect on how our summers at Grasshopper shaped the path of our individual careers. For me, Grasshopper sparked a life-long professional interest in the study of ruined architecture and its place in delineating social organization and identity. Perhaps more important, however, were the lessons learned about how to set up and run an archaeological

project, lessons that I have applied time and again in CRM and academic settings.

[64] *Chair*

Rigney, Phyllis

[284] *The Practicality of Microartifact Analyses in a CRM Context: A Case Study from Meade County, Kentucky*

Microartifact analysis has, in recent years, become a useful tool for analyzing spatial relationships within prehistoric sites and has been used most commonly to examine relationships within household contexts. This type of analysis is rarely utilized in CRM projects due to the extra time, effort, and costs necessary to complete such studies. This paper aims to address two questions: 1) Are microartifact analyses useful in understanding spatial relationships in non-household sites? 2) Are microartifact analyses a practical means of analysis within CRM contexts? An Archaic lithic workshop in Meade County, Kentucky serves as a case study to address these questions.

Riley, Ramon [110] see Welch, John

Riley, Tim (USU Eastern Prehistoric Museum)

[168] *Ancient Starchways in Museum Collections: An Investigation of Fremont Subsistence through the Microresidues Curated in the USU Eastern Prehistoric Museum*

Over the last several decades, there has been debate over the nature of Fremont subsistence. Different models have been proposed which suggest that members of the Fremont archaeological culture ranged from full-time foragers to full-time horticulturalists. Macrobotanical and stable isotopic data have been marshaled to support the proposed models, but one major class of evidence has been overlooked in the debate on Fremont subsistence patterns. Diagnostic starch granules provide direct evidence of plant use from food processing tools such as groundstone artifacts and ceramic vessels. This line of evidence is particularly useful as it can be applied to museum and other artifact collections from important sites excavated years ago. A comparative study examining starch granules from a suite of artifact types recovered from Fremont archaeological sites in eastern Utah would add another dimension to the debate on Fremont subsistence. The collections at the USU Eastern Prehistoric Museum are particularly well-suited to this investigation, due to the strong focus on Fremont artifacts. This paper highlights two aspects of the mission of this symposium, stressing the lessons learned about the challenges of working within museum collections as well as the lessons learned from the potential data in existing collections.

Rimer, Esther [284] see Cyr, Howard

Ringle, William (Davidson College), Gabriel Tun Ayora (UADY), Mauricio Germon Roche (UADY) and Matt Morris (Davidson)

[78] *Preclassic to Classic in the Valle de Yaxhom*

Recent research has significantly deepened the earliest horizons of settlement and monumental architecture in northern Yucatan. One regional focus of Middle-Late Preclassic settlement appears to have been along the base of the Puuc escarpment and the adjacent Valle de Sta. Elena, especially within the Yaxhom Valley at the eastern extreme of the latter. This paper discusses results of the second season of the Yaxhom Valley Project, during which a second large Preclassic Acropolis was mapped and test-excavated, two Late Classic palace compounds were documented, and the Aguada Xpotoit was test excavated. These, together with groups mapped during 2011, especially the

megalithic Yaxhom Acropolis, and other data from the Puuc, suggest broad trends in the development of Puuc social complexity, urban organization, and social memory, inasmuch as the site continued to be occupied through the Late Classic period. This paper will consider in particular the changing role of monumentality over this span, as well as the role of water management in the genesis of social complexity.

Rios, Jorge (Centro INAH Oaxaca)

[114] *Hallazgos funerarios recientes en Lambityeco-Yeguih: Consideraciones preliminares*

La Zona Arqueológica de Lambityeco, en Tlacolula de Matamoros, Oaxaca, comprende un área donde pueden observarse vestigios arqueológicos de diferentes épocas, donde podemos sugerir la presencia de dos momentos de expansión. El primero y menos estudiado, Brawbehl-Yeguih, uno de los primeros asentamientos urbanos del Valle de Tlacolula. El segundo momento, Lambityeco, posee una riqueza extraordinaria para comprender la reintegración de la región, después de los tiempos de Monte Albán como centro rector. En este trabajo se presentarán los recientes descubrimientos de contextos funerarios que nos aportan el conocimiento de la presencia cerámica y arquitectónica de las diferentes épocas de la arqueología de los Valles Centrales para el sitio, así como las implicaciones preliminares, espaciales y temporales, que derivan de este hecho.

Riris, Phil

[285] *Geospatial Modeling of Precolumbian Monumental Landscapes in the Eastern La Plata Basin*

Societies in the transition from relatively unstratified forms of organization to more hierarchical socio-political systems often develop more intensive historical ties to the region or landscape they inhabit. An example of such processes can be found in the highlands of north-eastern Argentina and southern Brazil, amongst the late pre-Columbian southern proto-Jê. Communities of this cultural affiliation erected and maintained monumental earthworks, including some of a mortuary nature, which display a multiplicity of different layouts, orientations, and placement in the landscape. Discussions of monumental meaning and function figure prominently in the regional literature, which has variously interpreted the tradition in terms of territoriality, social integration/exclusion and reinforcement of ethnic identity. This paper proposes that a deeper understanding of this archaeological phenomenon may be gained by testing these interpretations through inter-regional comparative analyses of different architectural complexes. A spatial model is presented in order to explore the structural properties of the monumental landscape around a sample of features, in terms of their affordances for human mobility and directed movement. Some preliminary results of these efforts are given, and their significance highlighted for the archaeological perception of pre-Columbian social complexification in eastern South America.

[285] *Chair*

Rissolo, Dominique (Waitt Institute), James C. Chatters (California State University, Fresno), Douglas Kennett (Pennsylvania State University), Yemane Asmerom and Pilar Luna Erreguerena (Instituto Nacional de Antropología e Historia)

[109] *Recent Analyses of the Late Pleistocene Human Skeleton from the Submerged Cave Site of Hoyo Negro, Quintana Roo, Mexico*

A relatively well preserved human skeleton found in spatial association with the remains of extinct megafauna deep within the submerged cave system of Aktun-Hu presents a unique and promising opportunity for interdisciplinary Paleoindian research on the Yucatan Peninsula. Investigations have thus far revealed a range of associated features and deposits, which make possible a multi-proxy approach to identifying and reconstructing the natural

and cultural processes that have formed and transformed the site over millennia. Recent and ongoing studies involve osteological and taphonomic analyses; absolute dating of human, faunal, and macrobotanical remains; human DNA analyses; and a consideration of site hydrogeology and sedimentological facies.

Ristvet, Lauren (University Of Pennsylvania)

[101] *Rethinking Identity and Tradition in Hellenistic Babylonia*
Over the last century, Seleucid Babylonia has been depicted as a case study of Hellenization, as an impermeable society that rejected Hellenization, and as a society where Greek and Babylonian cultures flourished. These interpretations are contradictory, but they share an uncritical use of the concept of tradition. While notions of "foreign" culture are often problematized, Mesopotamian elements tend to be accepted as "local," "traditional," and hence normative. But what does it mean to say that a certain practice is "traditionally" Babylonian in the Hellenistic period, 250-500 years after the death of the last "Babylonian" king? Who employed traditional culture, how did they use it to make sense of a changing world, and why did they choose these practices or objects? A review of settlement patterns, urban planning, pottery, and figurines indicate that many quotidian practices witnessed great change during this period. Other elements of life, however, particularly those connected with religion, scholarship, and administration appear pointedly conservative. Yet this apparent conservatism often masks a radical reinterpretation of "Babylonian" culture, and the appearance of invented traditions. Different populations within Babylonia employed these traditions as part of broad political practices, using them to negotiate Seleucid sovereignty and widespread economic and social change.

Rivas, Javier, Paulina Ivette Poot (Universidad Autónoma de Campeche), Ventura Rodríguez (Universidad Autónoma del Estado de Hidalgo), María del Rosario Domínguez (Universidad Autónoma de Campeche) and Raymundo Javier González (Universidad Autónoma de Campeche)

[33] *Chemical Characterization of Limestone Quarries from Oxpemul, Campeche*
The exploitation of stone materials became a very important activity for Maya civilization. As a result of this activity the Mayan people were specialists in stone work. They learned to select materials based on its quality, which determined its use either as construction material or as sculpture. This paper expects to contribute to an understanding of the exploitation of limestone quarries associated with the main architecture in Oxpemul, Campeche. Several samples of limestone from quarries, buildings, stelae and altars were selected to identify their chemical characterization by analytical techniques, such as X-Ray diffraction (XRD) and Scanning Electron Microscope (SEM). Subsequently, the chemical characteristics of samples from the quarries were compared to those from samples recovered from buildings, stelae, and altars to determine if the Maya were selecting specific types of limestone for use either in construction or sculpture. This allows us to identify the chemical characterization of the limestone exploited in Oxpemul archaeological site.

Rivera, Angel (INAH)

[159] *Una nueva mirada a la iconografía zapoteca clásica de la Tumba 7*
Construida en la época Monte Albán II, la Tumba 7 de Monte Albán tuvo una serie de ocupaciones a lo largo de su historia prehispánica. En esta ponencia se repasarán la iconografía del Clásico registrada en los objetos como urnas, pintura mural y piedras grabadas; un análisis comparativo con otras tumbas del Clásico descubiertas en Monte Albán mostrará que la tumba 7 fue una de las más grandes e importantes durante su época.

Rivera, Arturo [285] see Hahn, Randy

Rivera , Nohemy [166] see Pineda De Carias, Maria-Cristina

Rivera Castillo, Patricia, Boris Beltrán (Proyecto Arqueológico Regional San Bartolo-Xultun), David Del Cid (Proyecto Arqueológico Regional San Bartolo-Xultun), Estuardo Casasola (Proyecto Arqueológico Regional San Bartolo-Xultun) and William Saturno (Proyecto Arqueológico Regional San Bartolo-Xultun)

[21] *Tomb or Offering? Analyzing the Findings in Structure 11J7 at Xultun, Guatemala*

Dominating the southern sector of Xultun's southern ceremonial plaza group (Group A), an unusual triadic group of temple-pyramids sit, connected to one another by range structures and littered with small patios. Part of this massive triadic group, Structure 11J7, sits at the southwest corner of one of Xultun's central plazas. With evidence of at least two major construction phases, we believe this structure to have been a ceremonial locus of great importance since the Early Classic. During the spring 2012 field season, the discarded remnants of an important burial and a large early stela fragment were uncovered. These discoveries focused attention on this structure and eventually led investigations to an empty corridor within it (left unfilled by the ancient Maya) where a pair of ritually-complex deposits, termed Offering 10 and Burial 12, were discovered. An abundance of rare forms and foreign types of artifacts comprise the assemblages of these deposits, raising new and interesting questions regarding Xultun's Early Classic foreign ties and political clout.

Rizvi, Uzma (Pratt Institute)

[52] *Moderator*

[52] *Discussant*

Roache-Fedchenko, Amy (Syracuse University)

[261] *Maintaining the Military Agenda: Blacksmithing at Fort Michilimackinac*

The British military units that occupied fur trade fortifications during the 18th century were often faced with conditions that isolated them from major supply centers. Craftsmen like the blacksmith would have helped to maintain the material aspects of the military and colonial agenda. This paper presents information about blacksmithing at the fort and how the work of the blacksmith affected the social and political climate of Fort Michilimackinac.

Robbins Schug, Gwen (Appalachian State University)

[219] *Climate Change, Social Suffering, and Collapse: a view from Harappa*

In the third millennium B.C., the Indus Civilization flourished in northwest India and Pakistan. The urban period (2600-1900 B.C.) was characterized by long-distance exchange networks, planned urban settlements, sanitation facilities, standardized weights and measures, and a sphere of influence over 1,000,000 square kilometers of territory. Recent reconstructions of the fluvial landscape at the end of the third millennium B.C. demonstrate the Indus Valley was watered primarily by monsoon-fed rivers and that a weakened monsoon system led to increasing "hydroclimatic stress" at the end of the urban period (circa 2000 B.C.). In this paper, I examine the hypothesis that climate change and socio-economic disruption in the post-urban period at Harappa will be associated with biological consequences--increased levels of conflict, disease, and biocultural stress markers. A comparison of paleoepidemiological statistics for urban and post-urban period burial populations indicates the risk for violence and morbidity increased through time. In addition, rates of violent injury, infection, and 'stress' were uneven among burial communities in the post-urban period, supporting the claim that climate change and a growing pathology of power were correlated with the collapse of urban life at Harappa.

[219]

*Chair***Roberts, Benjamin (University of Durham, United Kingdom)****[93] Inventing Metallurgy I: A Global Perspective**

This paper will explore the debates on the invention of metallurgy from a global, rather than a continental, perspective. It concentrates primarily on copper metallurgy but with reference to the earliest use of lead, gold and silver and copper alloys. Beyond confusion over the definition of invention as opposed to innovation, it is argued that the primacy given to the earliest copper smelting in discussions has overshadowed other metallurgical developments in all metals. This paper explores the earliest identifiable metallurgical similarities and differences between regions, especially between Europe, Asia and Central and South America. The purpose is to analyse how and why metal was invented globally.

[93]

Chair

Roberts, Theodore [123] see Fehrenbach, Shawn

Roberts, Theodore (PaleoWest) and Shawn Fehrenbach (PaleoWest)**[206] A Predictive Model of Prehistoric Site Locations at Fort Irwin, California**

This poster investigates the efficacy of a GIS-based predictive model for prehistoric site locations at Fort Irwin, California. In addition, we examine changing site location patterns throughout prehistory, beginning with the Lake Mojave period (10,000-5,000 B.C.) and extending into the Shoshonean period (A.D. 1200-contact). We investigate the spatial variability of 518 prehistoric sites using the Fort Irwin site typology and a refined predictive model. The preponderance of prehistoric sites in this inhospitable part of the Mojave Desert is likely due to embedded lithic toolstone procurement strategies, seasonal seed and small animal processing requirements, and use of travel corridors linking spatially fixed resources. Our model assesses the relationships between relevant ecological and environmental variables and these factors in conditioning prehistoric site location decisions.

Roberts, Charlotte (Durham University), Sarah Groves (Department of Archaeology, Durham University), Darren Grocke (Department of Earth Sciences, Durham University) and Geoff Nowell (Department of Earth Sciences, Durham University)**[219] Does Migration in Life Affect Your Health? Stable Isotope and Paleopathological Analysis of People Buried at Early Medieval Bamburgh, Northumberland, England**

Research on living populations has documented the impact of migration on people's health, but very little work in bioarchaeology attempts to link the two fields. This paper tests the hypothesis that people buried at the 7th-8th century A.D. Bowl-Hole cemetery at Bamburgh, Northumberland, in north-east England, firstly, consisted of locally, non locally, and non-English born and raised individuals, and secondly that the health of these two groups differed. Isotope ratios of strontium ($^{87}\text{Sr}/^{86}\text{Sr}$) and oxygen ($\delta^{18}\text{O}$) were measured in teeth from 78 male, female and non-adult skeletons, stature was calculated, and cribra orbitalia, long bone periostitis, and maxillary sinusitis recorded. Over 50% of individuals were non-locals, with some possible origins identified as Scandinavia, the southern Mediterranean and North Africa. Men from Scandinavia were taller than all other men, and local women were the shortest. Local and non-local "native" people had higher frequencies of cribra orbitalia and long bone periostitis than the non-English. The data suggests that "natives" were less healthy than the immigrants, but the "osteological paradox" needs to be considered in the final interpretation. This paper will discuss the potential and pitfalls of integrating mobility isotope data with

paleopathology in exploring how migration affected health in the past.

Roberts, Heidi, Sharon Hull (University of Manitoba) and Mostafa Fayek (University of Manitoba)**[252] Sourcing Turquoise Artifacts from Seven Archaeological Sites in the Eastern Great Basin**

The ability to link turquoise artifacts to their original resource area establishes the foundation for the reconstruction of ancient trade routes. Twenty-eight worked and finished turquoise ornaments recovered from archaeological sites in Clark County, Nevada and Kane, Sevier, and Utah counties in Utah were sent to the Department of Geological Sciences, University of Manitoba for analysis by secondary ion mass spectrometer (SIMS). Their isotopic signatures were compared to the comparative turquoise data base and the origin of 13 of the turquoise artifacts was identified including a strong representation of the turquoise deposits at Halloran Springs in the Mojave Desert. This paper presents the results of our primary data and compares the findings to ethnohistoric trade routes and prehistoric distribution models.

Roberts Thompson, Amanda (University of Georgia)**[6] Rediscovering Fort Center: A Lost Landscape of the Seminole Wars**

Archaeological research at the Fort Center site has primarily focused on its famous array of prehistoric mound and ditch features. Located in Glades County, Florida near Lake Okeechobee and adjacent to the tributary, Fisheating Creek, the site also has a lesser known historic component. Specifically, a fort along Fisheating Creek was constructed during the Second Seminole War (1835-1842) and later reactivated during the Third Seminole War (1855-1858). The exact location of the historic Fort Center has been unknown; however, historic records and previous archaeological investigations placed the fort near the "Great Circle," a circular prehistoric ditch earthwork on the edge of Fisheating Creek. As part of the 2010 geophysical survey and testing of the Great Circle, work was conducted near the suspected fort location. The resistance survey results show linear anomalies that outline what appear to be a bastion, as well as possibly two walls of the fort. Given the variety of historic materials from our excavations near this vicinity, combined with the results of the resistivity survey, we interpret this area to be the historic Fort Center. Locating this structure is a first step in placing this locale in the broader social and political landscape of the Seminole Wars.

Robertshaw, Peter (CSU San Bernardino)**[133] Collective Action Theory and Those Despotic Bakitara**

Collective Action Theory examines how power is negotiated between rulers and subjects. Blanton and Fargher (2008) undertook a cross-cultural evaluation of the importance of collective action in the formation of 30 pre-modern states. The state that scored the lowest on the authors' measures of the importance of collective action in the workings of the state, and hence could be deemed the most despotic, is Bakitara (Banyoro) of Uganda. My paper explores the case of the Banyoro in more depth, using ethnographic and ethnohistorical sources. I argue that the highly centralized nature of this state in the nineteenth century was a product of an historical moment in which external revenues fueled the economy. The importance of internal revenues probably provided a stronger basis for the negotiation of power with the king by the populace in earlier centuries. The evidence indicates an essential tension between rulers and ruled. While this tension was notably expressed in ritual, it was also both materialized and negotiated in regalia and in the location and architecture of the royal enclosure. The archaeological evidence for earlier centuries provides some support for the contention that exclusionary and corporate power strategies may have been operating simultaneously.

Robin, Cynthia (Northwestern University)

[171] Preclassic Maya Households at Chan, Belize
 Chan is a Maya farming community located in the Belize Valley of western Belize with a 2000 year history (800 B.C. – A.D. 1200), which spans the Preclassic, Classic, and Postclassic periods of Maya society. This paper will explore Chan's Preclassic founding and development from the perspective of household residents during the Middle, Late, and Terminal Preclassic periods (800 B.C. – A.D. 250). Based on settlement survey estimates, between 150 and 300 people may have lived at Chan in the Preclassic period. Preclassic households were excavated at Chan underlying later households at a range of households across the community, from leading family households to humble farming households. This paper explores the Preclassic households of Chan's leading families which were associated with the ritual elaboration of an E Group and ancestor veneration as well as small-scale marine shell bead and obsidian blade craft working. It will also explore the wider range of Preclassic farming households and their agricultural terraces at Chan which have Middle Preclassic origins. The early dating and development of household and community organized intensive agricultural systems at Chan challenges conventional interpretations of the development of intensive agriculture in the Maya area.

Robinson, Erick (Ghent University)

[28] Early Holocene Abrupt Climate Change and Hunter-Gatherer Lithic Technological Organization in Northwest Europe
 Important changes in lithic raw material procurement, knapping technology, and projectile technology of Mesolithic societies in the southern North Sea basin were bound by two different abrupt cooling events at 9.3 and 8.2 cal B.P. The punctuated changes caused by these events occurred within the context of two more gradual environmental changes: the transition from coniferous to deciduous forests at the Boreal-Atlantic transition and the final inundation of the North Sea basin. In this presentation we carry out a diachronic interregional analysis in order to investigate the relative impacts made by these different paleoenvironmental changes on changes observed in lithic technological organization.
[28] Chair

Robinson, Mark (Louisiana State University), Holley Moyes (UC Merced) and Keith Prufer (University of New Mexico)

[36] Through the Cave: Ancient Maya Wood in Creating Sacred Space, Southern Belize
 Caves are well established as one of the most sacred features of the ancient Maya landscape. The preservation of wood in Kayuko Naj Tunich, a small dry cave in southern Belize, affords the opportunity to assess wood selection within a highly charged ritual setting. Wood samples from the Early Classic cave are identified as pine (*Pinus caribaea*) and spanish cedar (*Cedrela odorata*). Ethnographic and archaeological data verify the cultural value of these species and confirm the specific selection of wood resources in creating sacred space.

Robinson, Ashley [185] see Moore, Summer

Robinson, Lindsay (University of Wisconsin- Milwaukee) and Laura Villamil (University of Wisconsin- Milwaukee)

[290] Space and Power: Social Dimensions of the Built Environment at Margarita, Quintana Roo, Mexico

Margarita is a Classic period Maya center located in south-central Quintana Roo, Mexico. At the height of its occupation during the Late Classic period, the built environment of its urban cores was used to express and shape the social interactions of its inhabitants. With the aid of Geographical Information Systems (GIS), we examine how physical activities and movement through

space structure and reinforce social relationships. The analysis is focuses on meaning in built forms, proxemics, and accessibility of residential and public spaces throughout the site. This study contributes to the understanding of the reciprocal relationship between the built environment and the social landscape of Margarita during the Late Classic period.

Robles , Nelly M. [114] see Vera, Jaime

Robles Garcia, Nelly [114] see Campana, Michael

Robles Garcia, Nelly (Instituto Nacional de Antropología e Historia)

[159] Revisitando la Tumba 7 de Monte Albán: nuevas miradas interdisciplinarias
 El proyecto, "Aspectos Recientes sobre la Tumba 7 de Monte Albán," que se lleva a cabo a partir del 2010, busca revalorar aspectos de la interpretación de este emblemático hallazgo que en muchos sentidos marcó la arqueología de Oaxaca. A ochenta años de su descubrimiento, a la luz de nuevos estudios interdisciplinarios, y aplicando los nuevos conocimientos que se tienen sobre la arqueología Mixteca y Zapoteca de Oaxaca, se pretende valorar nuevas posibles interpretaciones de los múltiples aspectos culturales que se concentran en este hallazgo. En esta ponencia se puntuiza sobre aquellos aspectos que nuestro proyecto consideró que debían ser revalorados, algunos de ellos que incluso no fueron tomados en cuenta en el análisis original del hallazgo.

[159] Chair

Robson, Harry [68] see Gron, Kurt

Rodrigues, Antonia T [68] see Zhao, Xin

Rodrigues, Antonia (Simon Fraser University), Iain McKechnie (University of British Columbia) and Dongya Yang (Simon Fraser University)

[71] Ancient DNA Analysis of Archaeological Rockfish (*Sebastes spp.*) on the Northwest Coast of North America: Species Preferences and Implications for Marine Protected Area Management

Rockfish (*Sebastes spp.*) are slow growing, long-lived fish that have a significant economic, social, cultural, and ecological role in the Northeast Pacific Ocean today as in the past. Zooarchaeological data from throughout the Pacific coast indicate rockfish are ubiquitous throughout the region but the numerous species in this genus and their osteological overlap prevents linking aboriginal rockfish use with modern studies of species-specific rockfish ecology, habitat, and conservation.

Here we report on the development and application of an ancient DNA approach to identifying rockfish species. Archaeological rockfish skeletal samples from five sites (ca. 2500-250 BP) in a modern marine protected area were processed for DNA extraction in a dedicated ancient DNA laboratory and mtDNA markers were used for identification.

Preliminary results of this on-going project indicate DNA is well preserved, allowing species-specific identification of archaeological rockfish remains, which provides direct insight into traditional fishing practices and species preferences. The long-term perspective afforded by ancient DNA contributes to the accurate characterization of preindustrial genetic diversity as well as the evaluation of the potential impact of human fishing activities from archaeological contexts – contributions which can help inform conservation and management decisions particularly in marine protected areas.

Rodríguez, Enrique (University of Texas) and Wesley Stoner (University of Missouri, Research Reactor)

[136] *Cooking for a Change in Colonial Mexico*

Cooking and food preparation are often said to be traditional, conservative, and slow to change. In central Mexico, for example, people used cooking jars and griddles that remained remarkably similar in form and surface finish for centuries before and after the Spanish conquest. In this paper we argue first that the categories of change and continuity are too vague and that historical and archaeological analyses may benefit from more specific language to describe the very complex and different processes that we describe as change or continuity. We then present the results of a chemical characterization study of colonial cooking vessels from Xaltocan, Mexico. The analysis includes plain ware, lead glazed earthenware, and a comparison of the sources of different forms of pottery. The results show that while the pottery forms initially suggest continuity with pottery from the Late Postclassic, the sources of the pottery changed through time. This research suggests that, if change in indigenous culinary practices was indeed slow, cooks quickly adjusted their strategies of vessel procurement in order to maintain traditional culinary techniques in a rapidly changing social and economic world.

Rodríguez, Erin (University of California, Berkeley)

[238] *Construction and Use of Space at the Omo Temple Complex: Soil Micromorphological and Soil Chemical Approaches*

This paper will address an ongoing project analyzing construction methods and use of space at the Omo Temple Complex through soil micromorphological and soil chemical analyses. As soil based methods, including soil micromorphology and soil chemical approaches such as phosphate analysis and trace elements analysis, become more widely used worldwide for a variety of archaeological problems, this paper will place these trends within the questions and challenges of working in the south-central Andes. Field work in 2012 collected samples from the upper court rooms and in the sunken court of the Omo Temple. Analysis of these samples will be used to assess evidence of ritual practices, use of space, and construction methods through the primary traces visible to micromorphological and chemical approaches. This paper will provide an overview of the methodology, sample collection, and future directions of this project as well as a description of the challenges of micromorphological approaches in non-ideal sedimentary conditions. Along with describing the potentials of soil micromorphological and soil chemical approaches for archaeological questions, the future results of this project have implications for understandings of Omo and the Tiwanaku settlements of the Moquegua valley.

Rodríguez, Roberto [254] see Buhay, Bill

Rodríguez, Bernardo [20] see Valadez, Raúl

Rodríguez Galicia, Bernardo [234] see Zurita-Noguera, Judith

Rodríguez Mota, Francisco Manuel [107] see Acosta-Ruiz, Marco Antonio

Rodríguez Ramos, Reniel (Universidad de Puerto Rico-Utuado)

[292] *Puerto Rican Indigeneities*

Current notions regarding the late indigenous societies of Puerto Rico are built upon colonialist tropes that are erected upon two main assumptions: 1) their “peaceful” and “noble” character expressed in the ethnonym Taíno, and; 2) their quick extinction

after the Spanish invasion of our territories that resulted from their agencyless nature. The historical narrative that has been developed on the basis of these assumptions has been used to naturalize a condition of coloniality in the island through its insertion in the official discourse regarding our national identity, being institutionalized and commoditized through agencies like the Institute of Puerto Rican Culture and the Department of Education. However, in the past decades contestatory indigenous movements articulated both in the island and the Puerto Rican diaspora in different parts of the United States have been key in making evident the need of readdressing this colonized version of Puerto Rican historiography. Archaeology has been a late, albeit important participant in this issue. In this paper, I will address how archaeology can contribute for making new dialogues with our indigeneities, both in the past and the present, in order to start building a decolonized version of our precolonial history.

[254] *Discussant*

Rodríguez Suárez, Roberto [254] see Matheson, Carney

Rodríguez-Alegría, Enrique [140] see Overholtzer, Lisa

Rodríguez-Rellan, Carlos [51] see Valcarce, Ramon

Rodríguez-Rellan, Carlos

[196] *Knapping beyond Flint: An Experimental Approach to Quartz and Slate Industries*

Most specialists in lithic industries and experimental knapping have fundamentally focused their job on traditional cryptocrystalline raw materials, such as flint or obsidian; the knapping of other materials than those have usually been seen as very difficult—if not virtually impossible—due to their irregular fracture and little control of characteristics of the products. Other authors, on the contrary, have simply ignored the differences among these raw materials, assuming the existence of the same mechanical properties for all of them, circumstance that in many occasions have led to mistakes when analyzing lithic assemblages. The specific mechanical and crystallographic properties of raw materials such as quartz and slate and their effects during the knapping are explored in this paper: the experimental knapping has allowed us to observe the impact of properties such as anisotropy and cleavage, sometimes making it necessary to apply specific technical solutions and chaines opératoires. Some of these properties have been proven to be more an advantage than a hinder, since they allow saving time and effort during knapping.

[196] *Chair*

Roe, Lori (Murray State University), Anthony Ortmann (Murray State University), Lara Homsey (Murray State University) and Kit Wesler (Murray State University)

[284] *Incorporating Microartifact Research in Experimental Archaeology Education*

Experimental research provides a means to enhance our understanding of the distributional patterns and taphonomy of microartifacts in archaeological contexts. In this paper, we will describe a series of experiments designed to address how trampling affects the vertical and horizontal displacement of microartifacts in different types of sediment matrices; how intentional cleaning (e.g., sweeping) affects microartifact distributional patterns in activity areas and on prepared surfaces; and how burning at differential temperatures impacts various types of microartifacts (e.g., bone, ceramics, lithics). These experimental studies are being integrated into an undergraduate course on experimental archaeology which we argue has sound pedagogical

value for students. Namely it allows students to take a more experiential approach to learning archaeology and allows them to participate more fully in deciphering and reconstructing the archaeological record.

Rogers, Adam (University of Leicester)

[15] *The Oppida of Later Iron Age Europe*

This paper will take the form of a review and critical analysis of our current understanding of the settlement sites conventionally termed oppida (sing. oppidum) which appear in central and western Europe in the later Iron Age. The dates of origin for the sites range from the second century B.C. to the early first century A.D. The term oppidum as an archaeological category derives from Julius Caesar's description of settlements encountered during the Gallic Wars which he referred to in his writing as oppida (Latin (pl.) for town). In much of the archaeological literature they are described as towns or proto-urban sites but our interpretation of their nature and function is often influenced by our understanding of Roman urbanism that followed the Iron Age. Increasingly, however, these sites, which varied greatly in size, location, occupation density and duration, are being analyzed through more sophisticated methodologies and theoretical frameworks suitable for their own temporal and spatial contexts which is even starting to break down the traditional category of oppida itself. This paper will examine archaeological material and the work of recent research projects in an attempt to reach new understandings of the origins, functions and nature of this range of sites.

Rogers, J. Daniel (Smithsonian Institution), Claudio Cioffi-Revilla (George Mason University), Paul Schopf (George Mason University) and Sean Luke (George Mason University)

[23] *Climate Change, Extreme Weather, and the Cyber Long View: Experiments in Agent-Based Modeling*

Human responses to gradual and abrupt shifts in climate over long periods of time are an important theme in archaeological research, with considerable potential for assessing the vulnerability and resilience of coupled human-environment systems. This potential can be expanded further using agent-based modeling (ABM) to analyze aspects for which no archaeological data exists. In a simulated Bronze Age pastoralist society temperature trends and the frequency and duration of extreme weather were studied at differing spatial and temporal scales to test multiple climate change scenarios. The agent-based model was developed using the MASON simulation tool kit. Results indicate that adaptive system resilience is highly dependent on landscape variability in combination with certain social mechanisms that serve to sustain wealth and allow mobility of individual households. Kinship-based social mechanisms and resource sharing may provide adequate buffering against vulnerabilities in some environments yet fail in others.

Rogers, Alan R. [71] see Beck, R

Rohrer, Michael [190] see King, Stephanie

Rojas, Carol [236] see Chicoine, David

Rojas Pelayo, Lisseth [214] see Bautista, Stefanie

Roksandic, Ivan (University of Winnipeg)

[254] *Possible Sources of Migration in the Circum-Caribbean: Linguistic Introduction to an Archaeological Debate*

Theoretical considerations of the problem of migrations into and the peopling of the Caribbean region usually postulate that both

human groups, as well as plants and artifacts they used, came from the north-east part of South America and moved through the chain of the Lesser Antilles and onto the Greater Antilles. Recent research suggests that the picture is considerably more complex than previously thought, and that other possible source areas could include Central America, Mississippi coast, and Florida. A multidisciplinary approach that does not rely exclusively on archaeological methods, but also uses genetic and linguistic ones, is necessary at this stage to shed more light on these questions. We offer here an overview of possible source populations based on their linguistic affiliations and current archaeological understanding.

[254] *Chair*

Roksandic, Ivan [254] see Matheson, Carney

Roksandic, Mirjana (University of Winnipeg), Carlos Arredondo (University of Havana), Yadira Chinique des Armas (University of Havana) and Stephanie Armstrong (University of Winnipeg)

[254] *Changes in Mobility between Two Levels of Canimar Abajo Cemetery, Matanzas, Cuba: Paleodemographic Evidence*

Shell middens as burial grounds are a common occurrence in littoral areas around the world. Canimar Abajo, a shell midden cemetery in the Matanzas region of Cuba, is quite unique in presenting two levels of burial activities separated by 1500 years of a midden layer. We examine differences between these two cemeteries in juvenile/adult (J/A) ratio and the mean childhood mortality (MCM) to assess changes in the fertility pattern and potential sources of bias, between the two buried populations. The elevated number of buried children is associated with high fertility much more so than with juvenile mortality. High fertility has, in turn, been associated with a more sedentary lifestyle. Given the commonly encountered distinction between presumably mobile "apropiadores" and the sedentary "agroalfareros," Canimar Abajo - with its secure stratigraphic context and a substantial number of 14C dates on human skeletal remains - offers a possibility to examine these models in a single cemetery. The question of the changing (or not) identity of the occupants of the site and the persistence of a cemetery as a focal point after a 1500 years of burial hiatus requires us to draw on multiple and varied lines of evidence

Rolett, Barry (University of Hawaii), Eric West (Naval Facilities Engineering Command (NAVFAC) Paci), John Sinton (University of Hawaii) and Radu Iovita (Römisch-Germanisches Zentralmuseum, Mainz)

[274] *Voyaging in the East Polynesian Homeland: New Evidence from the Hawaiki Core Area*

The southern Cook and Austral archipelagoes play an over-sized role in Pacific prehistory, both as the gateway to central East Polynesia and as part of Hawaiki, the ancestral homeland for the New Zealand Maori. Early interaction spheres were critical in shaping these central East Polynesian chiefdoms. Yet although numerous sourcing studies have allowed scholars to trace the outline of southern Cooks voyaging networks, the Australis remain comparatively unknown. Our study helps fill this void by documenting a large adze quarry, Vitarua, located on Rurutu in the Australis. We present WD-XRF geochemical data for the Vitarua source rock and ethnographically collected adzes from Raivavae and Tubuai Islands, also part of the Australis.

Comparison of our results with previously published artifact and source data shows that:

- 1) Vitarua adze production began by A.D. 1300-1400.
- 2) Four of the adzes collected on Raivavae are made of raw material from Rurutu, including rock from Vitarua and two other sources (Na'a'iroa and Ta'urama).
- 3) An adze and core from the Ana'i'o site (Ma'uke, southern Cooks), dated A.D. 1300-1400, are made of stone from Rurutu's Na'a'iroa quarry.

Our findings indicate the importance of Rurutu as a node in voyaging networks spanning the East Polynesian homeland area.

[274] *Chair*

Roman Ramos, Israel [234] see Sereno-Uribe, Juan

Romanowska, Iza (University of Southampton), Ben Davies (University of Auckland), Tom Brughmans (University of Southampton) and David O'Sullivan (University of Auckland)

[23] *Finding Resources in a Desert: An Agent Based Model of Hunter-Gatherer Foraging*

The 'Foragers in Unpredictable Environments (FUE)' model has been designed to investigate the behavior of hunter-gatherers under highly changeable environmental conditions. This model explores the intersection between cultural and natural adaptations. We are particularly interested in agents' dependence on two different information sources: a culturally transmitted mental map/template of resource distribution (in this case the waterholes) and immediate environmental cues gathered from their surroundings. It was inspired by the human groups of non-coastal parts of Australia where Aboriginal tribes have developed a highly complex set of orally transmitted stories/myths which encode the location of waterholes and other resources.

The agent, representing a human group, makes decisions regarding where to move across the landscape while looking for resources based on environmental inputs as well as their own mental template of resource distribution. We model a range of strategies for resource exploitation under variable environmental conditions. We are also interested in how different network structures could be used to model the mental template, and whether certain structures influence the foraging success of the agents. By doing so, this model aims to contribute to our understanding of social-environmental dynamics in hunter-gatherer groups.

Romero, Danielle (University of Nevada, Las Vegas)

[86] *Corrugated Vessels as Signature: Household Identity at the Harris Site, New Mexico*

Design style can be replicated from long-term exposure to producers and their production techniques. Although styles may appear similar, various characteristics involved in manufacturing can be used to point out the differences. The variation seen in corrugated wares can be particularly useful in this type of investigation. The data gathered from these wares can provide information regarding the stylistic difference in ceramics produced and used by households at a given site. This poster focuses on artifacts recovered at the Harris Site in the Mimbres River Valley, New Mexico. The ceramics were recovered in various contexts from 20 pithouses and their associated features that have been excavated under the direction of Dr. Barbara Roth during the 2007-2012 field seasons. Numerous partially reconstructed corrugated vessels have been found and form the basis of this study. A combination of individual attribute and statistical analysis will be used to examine if corrugated vessels from this site can provide information regarding identity in terms of how households may have varied the wares they produced.

Rondeau, Mike [128] see Nelson, Amy

Roosevelt, Anna (Univ. Illinois, Chicago)

[283] *The Anthropocene in Amazonia*

The tropical rainforest in Amazonia, long considered an unchanging, virgin habitat inimical to human development, has been revealed by archaeological and ethnohistoric research to be a dynamic, human-influenced habitat. Even the earliest forest and river foragers left distinct traces of their occupations: small

openings and monotypic palm forests around their abandoned camps. Sedentary fishing communities left large shell-heaps that still alter drainage and soil chemistry in riparian localities even after 7,500 years. Topography in many regions was permanently altered by residential and ceremonial earth mounds, agricultural mounds, and causeways erected between 3000-500 years ago. Long-term horticultural villages created orchard gardens of valued species and deposited black soils full of sherds, discarded food remains, and charcoal. Lining rivers and lakes for hundreds of kilometers, these prehistoric anthropic deposits significantly improve conditions for plant growth and constitute the most important agricultural resource of current farming for urban markets. Clusters of valuable species such as Brazil nut trees, created by ancient villages, furnished Brazil's main 20th century cash export. Intensive fuel and timber use around late prehistoric centers and towns thinned and changed the composition of forest, aggravating droughts, a situation that has worsened in historic times.

Rorabaugh, Adam (Washington State University)

[170] *Toolstone as a Secondary Resource: An Investigation of Material Quality, Access, and Ownership over 5,000 years in the Salish Sea*

The importance of secondary resources and their ownership on the Northwest Coast has received increasing attention in the development of models of social inequality (e.g. Ames 1994, 1995, 2006). Moving past secondary archaeofaunas, I propose that toolstone may be viewed as a critical secondary resource tied to daily practices, and models of resource intensification and restricted ownership may be appropriate in its examination. A material quality index (MQI) is used to assess toolstone from 40 sites in the Salish Sea over the past 5,000 years. Material quality data is then compared with Brantingham's (2003) models to examine variation in toolstone access and ownership and its relation to tool retouch and curation at sampled sites. Degree of curation is measured using Andrefsky's (20a06) index of retouch for hafted bifaces. Elite control over resources is argued to play a key role in the patterning of toolstone and the degree of retouch of formed chipped and ground stone tools in the region, with several locations geographically close to high quality toolstones (e.g. Reimer 2011; Taylor and Skinner 2010) lacking high quality toolstone due to resource ownership. Sites without regular access to owned toolstone sources also display higher levels of tool curation.

Rosales, Michael [268] see Nigra, Benjamin

Roscoe, Paul (University of Maine)

[177] *Military Practice among the Hunter-Gatherers and Fisher-Gatherers of New Guinea*

New Guinea has been and still is home to a large number of hunter-gatherer and fisher-gatherer communities that have been largely overlooked and all but ignored in hunter-gatherer studies. At contact, all of these forager communities were at war on an ongoing basis with at least some of their neighbors. The forms and deadliness of their fighting, however, varied strikingly. Among the hunter-gatherers, most warfare took the form of small-scale surprise attack (ambush) waged overland. Sometimes, attacks were accompanied by cannibalism but almost never by headhunting. Among fisher-gatherers, in contrast, warfare mostly comprised large-scale, amphibious surprise attacks (raids) that could involve hundreds of participants and occasionally struck a hundred or more kilometers from home. These raids were sometimes accompanied by cannibalism and almost all involved headhunting: indeed, headhunting was often the principal aim of the raid. This paper reviews what we know of both the offensive and defensive aspects of these two forms of fighting and attempts to explain why they differed.

Rose, John (Salmon-Challis National Forest)**[174]** *Reviewing Consultation*

Native American tribes and federal agencies often find themselves consulting under an analytical framework that yields mixed results. This is especially true for consultation initiated in response to individual projects on public land. This paper examines the strengths and weaknesses with the current consultation model and offers suggestions for improvements.

[174] *Chair***Rose, Courtney (Pima County Office of Sustainability and Conservation)****[176]** *Yaqui Cultural Resilience to Colonialism: Implications for Understanding the Archaeological Record*

The Yaqui (Yo'emeem) have lived in Mexico and Arizona since time immemorial. Ethnohistoric, archival, and oral history records document a vibrant history of the Yaqui, and the impact of colonialism by Imperial Spain, Mexico, and the United States. The Pascua Yaqui Tribe in Arizona was federally recognized in 1978 and today is considered a powerful political entity. Through times of genocide, missionization, and deportation, the Yaqui have maintained their cultural integrity. This paper explores the ways the Yaqui have responded to colonialism through differential responses to various aspects of colonialism contributing to the cultural resiliency of the Tribe. Also discussed, are the archaeological implications for how a culture underwent numerous episodes of enculturation while maintaining its political status and cultural integrity can be recognized in the material record. The Yaqui continue to reside in Mexico and Arizona. Maintaining cultural integrity and political identity are now transnational issues, as the international border has become increasingly difficult to negotiate.

Rosen, Arlene (University of Texas at Austin), Ella Reiczyk and Steve Rosen**[162]** *Paleoecology of Early Pastoralism in the Negev: Phytolith Tales from the Dung*

Pastoral nomads began exploiting the Negev Desert around 6,000 cal BC. They stabled their goats in rockshelters in the semi-arid Negev highlands. This was the beginning of punctuated incursions by pastoralists into the desert regions over the course of millennia. Dung layers in these rockshelters have left a record of paleoenvironments and herding strategies during periods of occupation. Phytoliths from dung in the Ramon I and Atzmaut rockshelters identify possible micro-environments targeted by these early pastoral groups as well as differences in pastoral strategies through time. Neolithic herders seem to have favored the spring months while Bronze Age herders appeared in the winter. Both groups targeted seasonally moist microenvironments, possibly foddering with leaves of Phragmites (common reed).

[162] *Chair*

Rosen, Arlene [162] see Power, Robert

Rosen, Steven (Ben-Gurion University)**[225]** *The Pastoral Nomadic Edge*

Comparative analyses of material culture and architecture, combined with pastoral rock shelter stratigraphy from the Negev in the mid-Holocene, show a dynamic system of shifting patterns of desert pastoralism and sedentary-mobile relations. Functional and stylistic contrasts in the archaeological record allow distinction between mobile pastoralist and sedentary agricultural regimes, and thus the definition of sedentary zones, mobile zones, and zones of overlap. Stylistic analyses along with radiocarbon assays and pastoral rock shelter stratigraphy provide the tools for reconstructing the shifting boundaries of the pastoral zone. These in turn can be placed in a historical and archaeological context

offering explanation for the dynamics in terms of cumulative technological change, the rise of metallurgy and exchange, the development of urbanism and markets, shifting environmental parameters, and particularistic political conflicts.

Rosendahl, Daniel [2] see Ulm, Sean

Rosenfeld, Silvana (University of South Dakota)**[180]** *Bone Tool Production and Psychoactive Plant Consumption at Chavín de Huántar*

This paper addresses the production, circulation, and use of ceremonial artifacts at the temple of Chavín de Huántar. Elements of the particular paraphernalia associated with Anadenanthera sp. preparation and ingestion, such as bone spoons, tubes, and spatulas have been recovered in different sectors of the site. The analysis of the frequency, style, and distribution of these tools as well as the animal species and anatomical elements selected for manufacturing this special ceremonial kit will serve to discuss differential use across domestic and ritual areas of the site, perhaps elite versus commoners' access to the psychoactive plant, and changes in the tools through time.

Rosenstein, Dana Drake (University of Arizona) and James K. Feathers (University of Washington)**[147]** *Refining Radiocarbon and Historic Chronologies using Luminescence Dating: A Case Study from Melora Hill, South Africa*

The area around Melora Hill in northeastern South Africa is rich with Late Iron Age (1300-1850 C.E.) archaeology and has been studied since the 1980s. The defensive style of walling and evidence from excavations on Melora Hilltop associates the site with early 17th century farmers. Only limited salvage excavation has been undertaken on Melora Saddle, but a European glass trade bead from a perinatal pot burial suggests the settlement is from the mid-19th century. In 2010, a newly eroded, whole, in situ ceramic vessel was discovered in or adjacent to a degraded Melora Saddle hut floor. According to its Eiland-type decoration, the vessel dates to the Middle Iron Age (1000-1300 C.E.). This discovery confounds thirty years of interpretation regarding a 250-year sequence of occupation at Melora Hill. Results from luminescence dating on middens and burnt hut floors refine this chronology and offer researchers reason to reexamine the archaeology of the site.

Rosenthal, Jeff**[12]** *Toward a Social Landscape of Prehistoric Central California*

The Sacramento-San Joaquin Delta region represents one of the most economically productive landscapes in prehistoric central California. By at least 500 BC, distinct social boundaries coinciding with recognizable landscape features are apparent between prehistoric foraging groups within the Delta region. Archaeologically, these divisions are apparent at various geographic scales, marked by separate exchange networks and contrasting burial postures. These patterns represent the emergence and persistence of unified economies and shared belief systems across geographically contiguous territories, but not necessarily similar ethnicity or political cohesion.

Rosenthal, Jeffrey [12] see Fitzgerald, Richard

Rosentreter, Jeff (Idaho State University)**[183]** *Challenges of Fatty Acid Residue Analysis on Charcoal, Effects of Solvent Selection and Wood Species for the Effective Extraction and Quantification of Partition Coefficients*

Fatty acid residue analysis, on complex organic matrices such as

charcoal, poses a considerable analytical challenge. Our research objective has been to investigate chemical techniques capable of examining fire-pit charcoal for trace fatty acids and to develop standard procedures that produce quantified recoveries. This investigation focuses on fire debris from the US Great Basin. Additionally, a standardized method for the carbonization of wood into charcoal for the laboratory setting using a temperature programmed tube furnace to facilitate the creation of precise artificial samples has been developed. Most importantly, partition coefficients have been found between solid/solvent matrices containing various charcoal types in combination with a number of different organic solvents all of which vary in their properties. These distribution coefficients have been used to identify suitable solvent medium for optimal extraction. All final analyses were performed by first extracting the fat residue from the charcoal, esterifying the triglyceride into fatty acid methyl esters (FAMEs) by following the base-catalyzed esterification mechanism, and ultimately performing quantitative examination by using GC/MS methods. Quantitative partition coefficients obtained should aid others in identifying efficient extraction solvents for various organic sample applications.

Ross, Shawn [185] see Crook, Penny

Rossi, Franco (Boston University)

[21] *Taaj Group: Investigating the Home of a Xultun Scribe*

Ancient murals are rare in the Maya world, but rarer still are the archaeological remains of these murals' creators. This paper, based at the site of Xultun, Guatemala, explores a non-royal, elite residential complex (designated Taaj group) in which a non-public mural was discovered in 2010—in an effort to understand the lives and roles of its inhabitants during the Late Classic period (A.D. 550-950). During focused excavations in the spring of 2012, a series of artifacts related to the household, scribal practice, dedication and termination were found along with four undisturbed burials. One of these burials bears strong candidacy as having been the Xultun mural's primary artist. In this paper, I examine the link between these burials, the mural, and the evidence of associated ceremonial practices at Taaj group, providing a broad archaeological context and anthropological framing for this residential complex known to have been inhabited by mural (possibly even codex) producing scribes during the Late Classic period.

[21] *Chair*

Rossi, Franco [21] see Hurst, Heather

Ross-Sheppard, Callan (University of Auckland) and Melinda Allen (University of Auckland)

[181] *Social Differentiation and Obsidian Exchange: The Characterization and Sourcing of an Obsidian Assemblage from the Mussau Islands (ECA) by PXRF*

The nature of the social structures of the Lapita cultural complex in Near Oceania (~3500 B.P.) and the relationship between such structures and obsidian exchange has been a question of interest. Several Lapita sites in the Mussau Islands (Bismarck Archipelago, PNG) studied by Patrick Kirch, have produced substantial assemblages of obsidian derived from multiple sources, despite there being no local source in the island group. The assemblage from the largest of these sites was previously sourced and found to exhibit a degree of spatial differentiation, with one area of the site exhibiting a larger relative quantity of obsidian from more distant and high quality sources. This was suggested to perhaps reflect some form of social differentiation. However, the protocol used to source this assemblage was only able to attribute samples to a region rather than a single source. To address this limitation, PXRF was applied to a sample (N = 345) of the assemblage,

allowing for all samples to be assigned to a specific source. This analysis confirms the presence of spatial differentiation, however, due to other potential causes for the spatial differentiation, it is suggested that the hypothesis of social differentiation cannot be linked to the spatial differentiation using geochemical data alone.

Rostain, Stéphen

[60] *"Under the Volcano": Archaeology in the Sangay Site, Ecuadorian Amazonia*
Numerous pre-Columbian sites with artificial earth mounds have been found in the Upano valley, at the foot of the Andes, in the Ecuadorian Amazon. Large-scale excavations help to reveal techniques in building, mound functions, chronology of occupation, and house plan or associated activities. Groups of the Upano culture built these mound complexes from 500 BC and left the valley ca. 400-600 AD. These groups transformed the natural landscape building hundreds of earth mound complexes along terraces. Located at a key-area, Upano people had strong relationships with the Andean highlands, where they traded their pottery. The most striking aspect is the existence of a spatial pattern organizing mounds. The delimitation of a square or rectangular, low, and flat plaza is the basis of the spatial pattern in the Upano valley. It is closed on the four sides by mounds, modified slopes, banks or dug pathways. In several complexes, a central mound is built in the center of the plaza with four or six peripheral elevations. Recent mapping changes our understanding of the pre-Columbian occupation. The Upano culture ended because an enormous eruption of the Sangay which covered the valley with a thick layer of volcanic ashes.

Roth, Melissa (Simon Fraser University), Dana Lepofsky

(Department of Archaeology, Simon Fraser University),
Aubrey Cannon (Department of Anthropology, McMaster University), Camilla Speller (Department of Archaeology, Simon Fraser University) and Dongya Yang (Department of Archaeology, Simon Fraser University)

[71] *Using Ancient mtDNA to Chart Genetic Changes of Pacific Herring Populations off the Coast of Central British Columbia*

Pacific herring (*Clupea pallasi*) is an important species: biologically to marine ecosystems, economically to British Columbia, and culturally and economically to many coastal First Nations of the NE Pacific. Herring is in serious decline across the Northeast Pacific, but there is much debate on the nature of this decline and if/how it is linked to a loss of biological diversity in herring populations. This research examines mitochondrial DNA (mtDNA) of herring bones dating to as early as 7000BP recovered from stratified midden deposits at Namu, British Columbia. Sixty herring bone samples were processed for DNA extraction in a dedicated ancient DNA laboratory. A high success rate (83%) was achieved for the analysis of mtDNA sequences from bones weighing on average .02 g. High levels of genetic diversity were observed, providing a unique opportunity to document past genetic diversity and potential population size changes through time. The results of this study are applicable to modern management of Pacific herring and demonstrate the valuable role of ancient DNA in both archaeology and fisheries conservation.

Roth, Barbara (UNLV)

[175] *Pithouse Community Development in the Mimbres Valley, Southwestern New Mexico*

Recent investigations at the Harris Site, a Pithouse period (A.D. 500-1000) site located in the Mimbres River Valley of southwestern New Mexico, have documented clusters of related households that appear to be the core of community development at this site. In this paper, I examine the relationship between these household clusters and communal structures and their role in structuring the community at the Harris Site. I further explore the implications of these findings for understanding Pithouse period communities throughout the Mimbres region.

[232]

Discussant

Rothaus, Richard [83] see Boyce, Joe

Rotman, Deborah (University of Notre Dame)

[223]

Material Engagements and Social Encounters: Gendered Life in the Irish Immigrant Enclave of Beaver Island, Michigan, 1856-1903

Irish immigrants from Árainn Mhór, Co. Donegal, Ireland settled on Beaver Island in northern Lake Michigan and created an Irish-speaking enclave (a Gaeltacht) that spanned the second half of the nineteenth century. The identities and social worlds of these immigrant families were shaped by their interactions with a Mormon community that first settled on the island, Native Americans who lived elsewhere in the archipelago, and other ethnic groups with whom they interacted. Gender roles and relations were particularly affected as these Irish immigrants negotiated Old World traditions and New World realities through the social practices of their daily lives. Women in particular experienced both unique opportunities and cultural constraints relative to other contemporaneous Irish immigrant communities in the United States. The cultural landscapes of the island were loci of economic activity, family life, and ethnic performance as well as the arenas in which the Beaver Island Irish enacted gendered experience, continued traditions from their homeland, incorporated new cultural norms and ideologies, and otherwise navigated the multifaceted and ever-changing social worlds in which they lived.

Rouse, Lynne (Washington University in St. Louis)

[225]

A Line in the Sand: Production and Technology Exchange Between Mobile Pastoral and Urban Communities in Late Bronze Age Turkmenistan

In the Murghab alluvial fan region of southern Turkmenistan, Late Bronze Age (ca. 1950-1500 B.C.) interactions between mobile pastoral groups and settled agricultural communities are generally inferred from material culture proxies, most commonly pottery. While the ceramic assemblages of settled agricultural communities are well studied and amply documented and described, the elusive nature of mobile pastoralist remains has thus far precluded the complementary investigation of a ceramic assemblage from a mobile pastoralist occupation site. Recent excavations, however, have provided the first such assemblage available for comprehensive investigation of ceramic production practices outside urban agricultural centers. Results of a detailed ceramic analysis have revealed distinct but repeated choices on the part of potters regarding raw material and form type, as well as experimentation with wheel and kiln technology not typically attributed to Bronze Age mobile pastoralists but commonly found among urban communities of this period. The transfer of production techniques and firing technologies provides direct evidence of the interaction between mobile pastoral and settled agricultural communities and reflects on larger social exchanges between these two groups, whose relationships helped shape Central Asian history.

[225]

*Chair***Rowe, Sarah (University of Illinois)**

[165]

Building Bridges towards Effective Collaboration: the Entanglement of Archaeological Praxis with Local Knowledge

Archaeologists are deeply vested in the examination of tempos of change and materialized identities as detected with the forensics of carefully honed methods. For archaeologists, the importance of the past—and its conservation—is self-evident. Community collaboration provides an opportunity to share the epistemology of archaeology with those who reside outside of the circle of archaeological knowledge and influence. But real collaboration requires a bi-directional exchange of knowledge and, in many cases, grappling with schemas that include very different concepts

of time, the constituents of identity, and the significance of material remains of the past. We discuss the entanglement of Western praxis with non-Western local modes of knowing in multi-year collaborative heritage programs and note the transformational potential of this entanglement on archaeological “business as usual.” Discussion is based upon six years of grassroots collaborative cultural heritage programs in the Maya Region. Initiatives included classroom and extra-curricular educational programs, grade school curricula reforms, radionovelas, a puppet-military, heritage mapping projects, sponsored grants to indigenous communities for cultural heritage projects as well as grants to archaeologists who incorporate a collaborative program into their field research. We reflect on initiatives that succeeded and those in which an attempted rapprochement was lost in translation.

[165]

*Chair***Rozo, Jennifer (University of Chicago)**

[58]

Home on the Range: An Environmental History of Land Use Changes at Paa-ko, New Mexico

By using multiple lines of evidence from the archaeological material record, as well as from the environmental pollen record, this paper will explore the history of anthropogenic landscape changes at one particular site in the Galisteo Basin of New Mexico. Located on the margins of the Spanish mission system, the ancestral Pueblo site of Paa-ko and its surrounding field systems present an ideal opportunity to tease out the thread of colonial influences on local communities, particularly with the introduction of livestock into the region. The impacts of grazing continue to be felt into the present, as the eastern field systems are currently a privately owned ranch with small herds of cattle and horses. The transition from an exclusively agrarian landscape to an agropastoral landscape had dramatic and long-lasting social and physical consequences, and these dynamics will be the focus of this study. This project will explore the details of this physical transformation and examine these ecological shifts within the context of changing economics, politics, and aesthetics.

Ruane, Jonathan

[21]

An Urban Reservoir at Xultun, Guatemala

Water as the basis of life, agriculture, and plaster production has important implications for ancient Maya political organization. The lowland Classic Maya thrived in a region with no permanent surface water and only seasonal rainfall. In 2012 at Xultun, Guatemala, a large reservoir was discovered between two site ceremonial centers. The reservoir is bordered on the east and west sides by two causeways which functioned as dams redirecting runoff into the reservoir. Through test pitting and tunneling, an unusual pattern was identified on the bedrock surface: during the Preclassic, the reservoir's bedrock floor was modified into a series of steps and plastered over. This feature would have allowed access to water as levels dropped during the dry season. In the Late Classic, in response to population pressure, the reservoir was expanded through the construction of retaining walls and dredging. I argue that hydrological technology at Xultun changed radically from the Late Preclassic to the Late Classic, increasing storage capacity as populations expanded. Controlling larger volumes of water increased Late Classic Maya kings power base, supporting larger populations and allowing larger constructions.

Ruby, Allika (Far Western Anthropological Research Group) and Al Schwitalla (Schwitalla Archaeological Consulting)

[12]

The Antiquity of Southern Wintuan Occupation in the Sacramento Valley of California

The Southern Wintuan (Patwin) people of central California are one of the most linguistically diverse groups in North America. Early ethnographers mapped out linguistic territories that were thought to additionally signal cultural variation and later researchers offered various theories concerning prior population

movements and displacement of neighboring groups. It is now commonly accepted that Wintuan groups expanded southward from Oregon into central California, but the timing of this movement is debated. This presentation will briefly summarize the prior research and present archaeological evidence (painted tablets, charmstones, and burials) that we argue indicates the Patwin have occupied this territory for a much longer period than has been previously proposed.

Ruehli, Frank [114] see Campana, Michael

Ruff, Christopher [32] see Sadvari, Joshua

Ruiz, Joaquin [252] see Thibodeau, Alyson

Runggaldier, Astrid (Boston University)

[171] *Invisible Cities: The Buried, Dismantled, and Non-Mounded Maya Residences of Preclassic San Bartolo, Guatemala*

With an apogee of monumental construction and artistic achievement by the first century A.D., the site of San Bartolo can be characterized as a Preclassic Maya site. Yet, it has a substantial Late Classic phase of occupation and activity, so that virtually all residential mounds on the landscape today are Late Classic. Even with considerable construction suggesting a sizeable early population, monumental architecture is apparently all that remains of the Preclassic settlement. The palimpsest of settlement histories reflects the upward accumulation of occupation layers, but also their dismantling and obliteration, so that the early levels are often buried or even razed. As a result, for a Preclassic site with a substantial presence on the landscape, San Bartolo's Preclassic households are invisible. This paper presents the questions, methods, challenges, and results of the research to date on San Bartolo's Preclassic people, their residences, and their broader domestic landscape. In addition to data from the monumental core, current investigations at five house groups indicate that, where Preclassic layers underlie Late Classic ones, symbolic behavior suggests ritual practice connecting space across time, focused on the central axes of the early structures that became obscured as later phases successively grew in size.

Rupley, Eric

[30] *Fun with Flowcharts! (More Recent Research on the Origin of the State)*

Wright (1977) and (1978), "Recent Research on the Origin of the State" & "Toward an Explanation of the Origin of the State," are foundational documents for scholars engaged in understanding the development of the economically-complex socio-political formations we call "Primary States." I briefly explore 1) why these two papers were successful, 2) examine elements of theory developed in the intervening 35 years in light of these archetypal propositions, and 3) outline on-going research at the Santa Fe Institute, in which trans-disciplinary approaches to the evolution of early states leverage high-resolution, region-scale databases for cross-cultural comparison.

[56] *Chair*

Russell, Nerissa [9] see Pitter, Sharmini

Russell, Will (Arizona State University) and Margaret Nelson (Arizona State University)

[65] *People of Stone and Mud: Special Construction, Ritual Retirement, and Inanimate Personhood in the Mimbres Region*

Natural and built landscapes are afforded personhood, seen as alive, allowed identity, and given reverence in some traditions. People subscribing to such views animate their landscapes, including architecture. The departure of prehispanic residents from dwellings has been seen traditionally as an "abandonment" and end, but in this paper we consider the process as a transformation in the lives of people and their houses. Though vacant, unoccupied homes carry on as valuable pieces of human identity and history. The "life cycle" of built environments can include their conception (planning), birth (construction), vitality (inhabitance), death (depopulation), burial (ritual retirement), and veneration (visitation and offerings). Using information from prehispanic villages in southwest New Mexico, we describe how some houses were "brought to life" at the time of construction and "laid to rest" when human occupation ceased. Such processes involved the use of rare objects, ritual offerings, and the treatment of architectural components. Some such homes were visited after their closure and received offerings. We examine such practices and argue that some rooms constituted animated members of their respective communities. This in turn helps us better understand the changing relationships of people and places.

Russell, Nerissa (Cornell University)

[151] *Discussant*

Russell, Kimberley

[183] *PXRF for Compositional Analysis of Early American Metalware*

Portable XRF is used worldwide to identify and sort modern metals and alloys for purity, quality control, and recycling. PXRF has been shown to be particularly effective for in-situ measurements as these nondestructive analyzers provide fast, simple, accurate and cost-effective compositional analysis of metals and alloys. The use of integrated cameras and small spot collimation make them particularly useful for the analysis of small samples and small areas on large samples.

The nuances of PXRF technology for the compositional analysis of metals and alloys will be described. Examples of its use for the characterization of Early American metalware, including iron, silver, copper, pewter, and brass in household, decorative and other objects will be demonstrated.

Russeva, Victoria [217] see Privat, Karen

Rutecki, Dawn (Indiana University Bloomington)

[198] *Authenticity in the Public's Archaeological Imagination*

Archaeotourism presents a growing avenue for tourists seeking authentic pasts. But how is authenticity defined in these contexts? What kinds of authentic archaeotourist experiences are possible at re-created and re-constructed archaeological sites? Using Spiro Mounds Archaeological State Park, Oklahoma, as a case study, this paper examines the theoretical implications of how reconstructed archaeological sites serve as important nexuses of past remembrance and modern forgetting. Discussing the destruction and re-creation of important segments of this site, I argue that authenticity must be contextualized to understand which authentic experience is presented for consumption by different publics. Furthermore, these experiences affect how people engage with the past and reinforce how archaeologically generated knowledge is produced and consumed in popular media.

[198] *Chair*

Ruttle, April [217] see Collard, Mark

Ruvalcaba, Jose (Instituto de Fisica UNAM), Emiliano Melgar (Museo del Templo Mayor INAH) and Kilian Laclavetine (Instituto de Fisica UNAM)

[252] *Study by Non-Invasive In Situ Spectroscopies of Turquoise Mesoamerican Artifacts*

This work focuses on the application of Raman, Infrared (FTIR) and X-ray Fluorescence (XRF) spectroscopies for the characterization of tesserae of turquoise and pieces of blue minerals of Mesoamerican artifacts discovered in various archaeological sites. The aim of these studies is to provide new information about the mineral identification and probable provenance of the blue minerals used in the manufacturing of the artifacts. Moreover, this in situ approach using small portable spectrometers allows the analysis of a significant amount of tesserae and the study of outstanding objects and collections directly in the museums and in the archaeological sites. In this case, the comparison of the composition of a representative set of pieces from the Mexica offerings of Templo Mayor of Tenochtitlan, as well as the analyses on pieces from Tula, Chalchihuites, Teteles and Chiapa de Corzo, are presented.

This research has been supported by CONACyT MOVII II 131944 and PAPIIT UNAM IN403210 ANDREAH grants.

Ruvalcaba Sil, José Luis [253] see Cockrell, Bryan

Ruvalcaba-Sil, Jose Luis [229] see Lopez, Julieta

Ruzicka, Annette (Washington State University, Pullman) and Colin Grier (Washington State University, Pullman)

[262] *Collaborative and Community-based Archaeology on Galiano Island, British Columbia, Canada*

The importance of collaborative, community-based archaeology has been increasingly recognized in recent decades. The significance of considering multiple perspectives in archaeological research, especially those of indigenous populations with historical connections to archaeological sites, has been recognized as crucial to interpretive depth. We present research conducted at Dionisio Point on Galiano Island, southwestern British Columbia as a case study in collaborative archaeology. This project successfully identified and combined the interests of indigenous groups, including the Penelakut First Nation and Hul'qumi'num Treaty Group, archaeological researchers, and British Columbia Parks. The 2012 excavation of the Perry Lagoon Midden Site (DgRv-006) at Dionisio Point was made possible through collaboration in research design and implementation. Here, we present the history of the project and the various actors involved. The outcome was a coordinated salvage excavation that recovered archaeological data through a methodology consistent with Hul'qumi'num traditions of cultural heritage management as expressed in Hul'qumi'num customary law. We identify key components of the project that enabled these positive working relationships to emerge and discuss processes and outcomes in relation to their applicability to other archaeological projects.

Ryan, Timothy [74] see Gosman, James

Ryzewski, Krysta (Wayne State University) and Thomas Urban (Research Laboratory for Archaeology and the Histor)

[230] *"Archaeologists Will Do Anything to Get a Date!" Richard Gould's Recent (and Unforgettable) Contributions to Scientific Inquiry and Community Archaeology*

Never short of hilarious anecdotes and colorful descriptions, Dick Gould's passions for teaching, researching, and mentoring have either inspired generations of students to pursue careers in anthropology or to incorporate anthropological training into their respective professions. Throughout his career and at the heart of his practice, Dick maintained a core set of principles about the role

of scientific inquiry in archaeology. Though perhaps overshadowed at times by the excitement of moving between fieldwork locations, time periods, or anthropological sub-specialties, Dick's consistent principles anchored his archaeological practice, permitting him the flexibility to move innovatively into uncharted archaeological territories. We had the honor to work with Dick as he made a transition in his research from maritime to forensic archaeology. Our presentation details some of the lasting effects that Dick's most recent archaeological work has had on his students, our discipline, and the communities with whom he worked.

Ryzewski, Krysta [257] see Bocancea, Emanuela

Sabatelau, Felipe [224] see Araujo, Astolfo

Sabol, Donald [206] see Buck, Paul

Sacks, Ben [20] see Brown, Sarah

Sadvari, Joshua [9] see Haddow, Scott

Sadvari, Joshua (The Ohio State University)

[32] *The People and Their Landscape: Changing Mobility Patterns at Neolithic Çatalhöyük*

This paper explores the relationship that the Neolithic inhabitants of Çatalhöyük shared with the landscape upon which they lived, worked, and interacted, especially in terms of shifting patterns of mobility. Cross-sectional geometric analysis combined with external long bone measurements of human skeletal remains indicates heightened mobility levels in the later phases of Çatalhöyük's occupation, and multiple lines of evidence contribute to explaining the potential factors involved in this increase, both at local and regional levels. Locally, the gathering of plant resources, both for food and fuel, as well as an expansion of the area used for caprine herding impacted levels of human movement around the site. At the regional level, increasing mobility through time is further evidenced via the acquisition of new and distant raw materials, technical practices, and traditions (for example, in tool manufacture and personal adornment). As a whole, these data provide a record suggesting heightened mobility among the people of Çatalhöyük over time, a pattern consistent with the expectations of changing environment, resource acquisition strategies, and social setting.

[9] *Chair*

Sadvari , Joshua [32] see Agarwal, Sabrina

Safi, Kristin [77] see Dolan, Patrick

Safi, Kristin (Washington State University) and Andrew Duff (Washington State University)

[175] *Largo Gap and the Pueblo II Period Great House Communities of the Southern Cibola Region*

Changing environmental conditions led to an influx of people into the southern Cibola region of west-central New Mexico during the Pueblo II period. With the influx of migrants came the introduction of multiple late PII Chacoan-style great houses, each with a spatially clustered association of households. Little research to date has been devoted to understanding the interacting relationship between these great houses and their spatially associated households, or the degree to which each great house community was socially integrated with others within and beyond the Cibola region. Here, we focus on the Largo Gap great house

and examine not only the interplay between it and its associated support community, but also its role as one of several late PII great houses within this spatially limited region. We present survey and excavation data from around Largo Gap in order to evaluate the relationship of the great house with spatially related households, as well that examine the scale of interaction, overlap, and distinction between the Largo Gap community and that of its nearest great house community neighbors, Cox Ranch Pueblo and Cerro Pomo.

[232] *Discussant*

Saggers, Sherry (Curtin University)

[230] *From Archaeological Experimentation to Applied Anthropology: Dick Gould, Materialism, and the Fashioning of an Anthropological Career*

My Ph.D. thesis, "Materialism and archaeological experimentation," tested one of Dick Gould's theories that the presence of exotic lithic material in surface and excavated Australian sites was an "archaeological signature" of long-distance trade networks which allowed desert dwelling Aborigines to share resources with their neighbors in times of ecological stress. This hypothesis was based on Dick's influential ethnoarchaeological research in the Western Desert, in which he attempted to connect "behavior and material residues in the context of living, contemporary societies" (Gould 1980:x). I was an accidental archaeologist, and it was our shared interest in materialist explanations for human behavior and Dick's ongoing support, that persuaded me to test ideas about stone tool selection in the Australian desert. That postgraduate experience provided the foundation for my 30 year teaching and research career in Australia, much of which has focused upon practical solutions for disadvantaged populations, particularly Indigenous people. In 1980 Dick wrote about "a new kind of anthropology that is based upon the observation and interpretive skills that are peculiar to archaeology" (Gould 1980:3). This is the anthropology that has shaped my understandings of contemporary societies facing stress and uncertainty.

Sahoglu , Vasif [288] see Kilikoglu, Vassilis

Sailors, Damion

[176] *Manu: An Analysis of the Customary Practice of Oceanic Kite-Flying*

Kite use in prehistoric and early historic Oceania was wide spread and practiced for a variety of reasons. Oral traditions and ethnographic accounts on a pan-Pacific scale speak of ancient kites that exploited the wind in creative and practical ways. The range of these practices included chiefly competition, fishing, meteorology, navigation, spiritual meditation, recreation and for locomotion. Unfortunately, in the Pacific Island archaeological record, there is a dearth of material evidence related to kite-flying and consequently the subsequent analysis of this enigmatic technology required alternative research methods which primarily focused on experimental techniques. After drawing upon archival research, simple shape analyses, historical linguistics and field observations, a range of functional replica Pacific Island kites were constructed and then tested in comparative flight scenarios that were performed to "...enhance analogies for archaeological interpretation" (Mathieu 2002:2-12). This research is valuable in an archaeological context because it considers material issues of Austronesian prehistory that oral traditions and ethnography alone cannot resolve. It also has the merit of reevaluating useful anthropological information regarding general Pacific history, Oceanic migration, socioecological networks and the resiliency of Pacific Island communities.

Saint-Charles Zetina, Juan Carlos (INAH), Fiorella Fenoglio (INAH) and Carlos Viramontes (INAH)

[63]

El Rosario: un asentamiento teotihuacano en San Juan del Río, Querétaro

El Rosario es un sitio arqueológico localizado en el Valle de San Juan del Río, Querétaro. Desde los años ochentas del siglo pasado se sospechaba que era un sitio teotihuacano. Sin embargo esto pudo ser confirmado plenamente hace apenas tres años, cuando se realizaron exploraciones en el edificio principal, en el cual se registraron cuatro etapas constructivas, de las cuales las tres primeras se asocian a Teotihuacan y la cuarta corresponde al período Epiclásico. De los elementos que permitieron establecer la correspondencia de El Rosario con Teotihuacan destacan los sistemas constructivos y la presencia, en la primera etapa constructiva, de murales policromados en el pórtico correspondiente al recinto sagrado de esa etapa. En esta ponencia presentamos un resumen de los resultados de las exploraciones realizadas en el año 2009 y los resultados de los análisis de materiales diversos.

Saito, Naoki [204] see Foin, Jeremy

Sakaguchi, Takashi

[112] *Foundations of Jomon Male Symbolism Seen from Vessels with Phallic Spout*

This paper explores male symbolism focusing on the analysis of vessels with phallic spout, which were produced from the middle of the Late to the beginning of the Final Jomon (ca. 3820-3120 cal B.P.). The analysis is based on three sources of information: 1) temporal and spatial distribution, 2) stylistic analysis, and 3) archaeological contexts. For the analysis, a database consisting of attributes, such as archaeological context, vessel form, pottery sequence and presence/absence of decoration, extracted from published sources was created. This database provides invaluable information to assess the number, type and context of vessels with phallic spout throughout the Japanese archipelago. Although the many vessels represent secondary deposition, cases found in housepit floors, burials, large and small pits, and elsewhere suggest that temporal and spatial variability of male symbolism.

Sakaguchi, Jo Ann

[219] *Biological Adaptations to Environmental Stresses in the Minatogawa Fossils from Okinawa, Japan*

Several studies on the Paleolithic human skeletons, known as the Minatogawa fossils, have indicated that the causes for stress-induced morphological modifications were poor health and nutrition and adaptations to physical stresses in response to the harsh environmental conditions in Okinawa. This paper will review previous studies and provide a detailed explanation on how biological adaptations to environmental stresses are relevant to understanding the health and life history of the Minatogawa people. Some of the indicators of environmental stress include muscle developments, stature, dental diseases, degenerative diseases, squatting facets (cervical fossa of Allen and Charles' facet), Harris Lines, auditory exostoses, and trauma. Re-examination of these studies revealed that the Minatogawa people adapted to the environmental stresses, attributed to limitations in resources and technologies and isolation from mainland Japan, by developing smaller body sizes for energy consumption, short and stout legs and feet with strong muscle attachments for locomotion on narrow and rough terrains, strong masticatory muscles with severe dental attrition for high chewing stress from coarse and tough foods, degenerative modifications from high locomotion and squatting, cervical fossa of Allen and Charles' facet from habitual squatting, Harris lines from childhood growth disruptions, and auditory exostoses from exposure to cold water.

Sakai, Sachiko [186] see Rice, Omar

Sakai, Masato (Yamagata University), Jorge Olano (Yamagata University), Yoichi Watanabe (Yamagata University) and Isao Akojima (Fukushima University)

[214] *Human Activities from the Late Paracas to Inca Period at the Pampas de Nasca, Southern Coast of Peru*

This study is part of the project "Interdisciplinary research on the vicissitude of the Andean civilization and its environment" that aims to examine the interrelation between the Andean civilization and its environment. The purpose of this study is to examine the human activities from the Late Paracas to the Inca Period (ca. 400 B.C. — ca. A.D. 1600) at the Pampas de Nasca of the southern coast of Peru, where we have conducted field research since 2010. First, according to geomorphological studies, this paper deals with ancient people's recognition of the Pampas de Nasca and the principles by which they selected some areas of the Pampas to make the animal figures. The representative figures are the Monkey, the Hummingbird, the Spider, and so on. Second, according to archaeological and cognitive psychological studies, the authors attempt to distinguish the difference between the animal figures of Paracas and Nasca period. Finally, this paper investigates the human activities related to the radial lines and their centers, where many archaeological remains were found. From these findings, we can estimate when these lines and centers were used and show the temporal changes in the distribution of the lines at the Pampas de Nasca.

Sakai, Sachiko (UC Santa Barbara)

[267] *Application of Optically Stimulated Luminescence (OSL) Dating to Examine Change in Production and Distribution Pattern of Olivine-Tempered Ceramics in the Arizona Strip and Adjacent Areas in the American Southwest*

The ceramic assemblage in the Arizona Strip and adjacent areas is characterized by widely-distributed ceramics tempered with olivine, a volcanic mineral, between A.D. 100 and 1300. The source of this olivine is thought to be at Mt. Trumbull and Tuweep, near the northwest rim of the Grand Canyon. Olivine-tempered ceramics are distributed westward from these olivine source areas over a range of more than 100 km. The ultimate goal for this study is to understand the evolution of production and consumption patterns of olivine-tempered ceramics among a small-scale society within unstable agricultural environments. To investigate the source of olivine-tempered ceramics, chemical compositional analyses on ceramic samples and clay including INAA and Laser ablation ICP-MS (LA-ICP-MS) were used. Eight compositional groups were found in the 1069 LA-ICP-MS ceramic data from Mt. Trumbull and the lowland Virgin area, which is the one of the destination of olivine-tempered ceramic trading. In this study, I would examine how the use of each clay group changed over time using optimal stimulated luminescence dating on the sherds with compositional data.

Salas, Miriam [78] see Pugh, Timothy

Salay, Paul [48] see Giessler, Kalena

Salazar, Lucy

[164] *The Machu Picchu Solution: A New Model for Cultural Patrimony Disputes*

The dispute over the Bingham collections from Machu Picchu was resolved by formal agreements by Yale University with the Peruvian government and with the University of Cusco (UNSAAC) bringing to an end nearly a decade of discord. At the core of the agreements was an attitude of mutual respect and appreciation between the three parties, with the Peruvian government and our

colleagues at UNSAAC acknowledging the historic importance of Bingham's investigations and of Yale's role in conserving and investigating the collections for nearly a century. At the same time, Yale University recognized the unique importance of the Machu Picchu site for the people of Cuzco and the Peruvian nation, and the need to recognize Peru's ownership. The agreements are built on the shared commitment to displaying these collections to the public, preserving them with adequate security and conservation, and guaranteeing that they remain accessible to researchers. The return, display and conservation of the Machu Picchu collections are treated in the agreements within a broader framework that involves scientific investigation, student and faculty exchange, and other long-term collaborations between Yale and UNSAAC. Thus, the agreement enriches both universities, providing new resources and opportunities for everyone concerned.

[164] *Chair*

Salazar-García, Domingo [20] see Guiry, Eric

Salazar-García, Domingo Carlos (MPI-EVA Plant Foods Research Group), Olaf Nehlich (University of British Columbia, Department of Anth), Stanley H. Ambrose (University of Illinois, Department of Anthropology), Michael P. Richards (MPI-EVA, Department of Human Evolution) and Amanda G. Henry (MPI-EVA, Plant Foods Research Group)

[172] *New Insights into Dental Calculus as Paleodietary Markers: Collagen, Carbonate, and Calculus Stable Isotope Values from a Mudéjar Medieval Cemetery in Eastern Iberia*

Dietary reconstructions rely on stable isotope analyses of bones and teeth because the biogeochemistry of bone collagen and apatite is well known. Previous work has shown that dental calculus may be an appropriate source for isotope analysis due to its composition. Sampling calculus does not damage teeth, so it can be used where destructive analyses are not possible. Collagen and apatite of bones and teeth reflect long-term averages of diet during their formation. However, it is not yet clear how much time calculus represents, what portions of the diet it records, and the effects of diagenesis. We have compared the results of carbon and nitrogen stable isotope analyses of bulk calculus and different calculus fractions (isolated proteins, carbonates) to those from bone and dentine collagen and apatite. These analyses have been performed on individuals from the El Raval Mudéjar Medieval Cemetery (Eastern Iberia, XVth century A.D.). Our results provide further insight into the role of isotopes from dental calculus as dietary markers. Although there is still much more work to do in this field before considering them as useful paleodietary markers, interesting patterns are observed when comparing the values of the different skeletal tissues and compounds.

Saldana, Melanie (California State University Los Angeles)

[109] *Chair*

Salustro, Derek [125] see Manahan, T.

Salyers, Kimberly (University of California, Berkeley)

[197] *Illuminating Social Landscapes: Unearthing Life of the Mayan Commoner through Household Excavation and Catchment Analysis*

This presentation will discuss the results of a catchment analysis for Classic Maya Chinikha, examining how geographic setting and access to resources shaped the daily lives of Maya commoners there. A "catchment" is the zone from which residents of a place drew their resources. Catchment analysis is a way to model economic relations in prehistoric sites. This catchment analysis uses GIS mapping to assess the accessibility, profusion, and seasonality of the plant, animal, and mineral resources actually

used at Chinikihá. Drawing on data from ongoing excavations there, it maps likely resource zones focused on one commoner household. The project aims to assess how the carrying capacity of the Chinikihá area's natural resources strengthened or weakened its integration in the wider region of Chiapas, including its politically influential neighbors, such as Palenque.

Samuelson, John [34] see Lockhart, Jami

San Roman, Manuel (Universidad de Magallanes), Jimena Torres (Université de Paris I, UMR 7041, France) and Flavia Morello (Centro de Estudios del Hombre Austral, Instituto d' [26] *Maritime Peopling Sequences on Southern Patagonia and Tierra del Fuego: Discussing Discontinuity and Reassessing Cultural Traditions*

In this paper, the chronological, techno-economic and subsistence characteristics of archaeological assemblages in three areas of Fuegian-Patagonian archipelago are discussed. So far, in the context of grant FONDECYT No. 1085329, we have conducted, extensive excavations in three localities: Englefield Island, Punta Santa Ana and Dawson Island (Otway Sea and Strait of Magallanes, Chile). In addition we have carried test pit excavations in Antonio Varas Peninsula (Última Esperanza, Chile). The dates for the eight sites identified range between 6500 to 700 years B.P. The analysis of the technology and economy at these sites reveal significant changes that can be organized in three periods: 1) 6500-5500 B.P.; 2) 5000-3000 B.P.; and 3) post-2000 years B.P. Two chronological gaps were identified in the archaeological sequence and several differences are discussed regarding the continuity of the settlement process. In addition, we present possible explanations concerning the cultural processes that took place during this time at these sites.

San Roman, Manuel [26] see Morello Repetto, Flavia

San Román, Manuel [26] see Martín, Fabiana María

Sanchez, Guadalupe [148] see Sanchez, Ismael

Sanchez, Ismael, Guadalupe Sanchez and Michael Brack [148] *Paleoindian Lithic Industry of Fin del Mundo Site, Sonora, Mexico*

The Fin del Mundo site located in Sonora, Mexico, contains an exceptional record of prehistoric human occupation spanning from Paleoindian to Sedentary periods. The Clovis occupation is very well represented and several Paleoindian Loci have been identified at the site including a gomphotere kill feature, several camp areas and quarries. A vast quantity of Paleoindian lithic artifacts (e.g. endscrapers, blades, cores, bifaces, points and other), have been recovered from the surface of different loci of the site, and the excavation at locality 1 (gomphotere kill feature). These materials reflect a variety of activities, from hunting, procurement and household activities. Here we will describe and discuss some aspects of the lithic technology at Fin del Mundo and will present some observation regarding the Clovis tradition of Sonora.

Sánchez, Carlos [78] see Pugh, Timothy

Sanchez Miranda, Guadalupe [126] see Carpenter, John

Sanchez Miranda, Guadalupe (Museo de Sonora INAH) and John Carpenter (Centro INAH Sonora) [220] *The Distribution and Quantity of Clovis,*

Folsom, and Plainview Points and Sites: An Update and Critical Review of the Peopling of Mexico

The geographical location occupied by Mexico in the Americas identifies it as a significant region among those models that attempt to explain how the first Americans reached the tip of South America so early in the New World sequence. The Paleoindian period in Mexico remains poorly known and poorly understood, and many of the proclaimed early sites are problematic and in need of reevaluation. We grouped the currently available evidence into three types: 1) directly dated human bones; 1) Clovis, Folsom and Plainview points and sites; and 4) miscellaneous archaeological remains found across the country of Clovis age. The Clovis tradition is very well represented in Sonora and at least ninety percent of the known Clovis points from Mexico have been found here, and Plainview and Folsom points are abundantly represented in the states of Chihuahua and Nuevo Leon, however, further to the south, Paleoindian evidence greatly diminishes. A critical review of the documented remains and propositions for future research are also discussed.

Sánchez Mosquera, Amelia

[1] *Contract Archaeology and Regional Models, an Intrinsic Relationship: Two Cases*

Contract archaeology began in Ecuador in the late 20th century and is now widely considered a component of environmental impact studies. The development of infrastructure allows us to have, from the archaeological point of view, a regional perspective by means of transects through areas that will be affected by these types of projects, without which perhaps we would not otherwise have. The research strategy proposed by the archaeologist provides the opportunity to obtain regional data and to test models of occupation. This paper will review the cases of the Baba river basin (Multipurpose Baba Project) and the riverbanks of the Napo river (Tena Airport).

Sand, Christophe [181] see Chiu, Scarlett

Sand, Christophe (Institute of Archaeology of New Caledonia and the Pacific (IANCP))

[292] *Archaeology of Western Contact and Colonization in New Caledonia: A Southern Melanesian Perspective*

The large archipelago of New Caledonia was the last major part of Melanesia to be put on a Western Map by Captain J. Cook in 1774. The rare contacts that followed for another half century, have until recently led to believe that 'first contacts' had no consequences for the indigenous Kanak societies of the Southern Melanesian Islands. But recent archaeological data has profoundly challenged this assumption, by showing a massive population crash starting well before the middle of the 19th century, with diverse consequences for the local populations. In 1853, French took over this malaria-free archipelago, with the scope to install a Convict Colony, copying the Australian model. The arrival of 30000 convicts over the succeeding half century, escorted by militaries, guardians, administrators, salesmen, free settlers etc., prompted a harsh colonial process, the Kanaks being spoiled of most of their fertile land to allow the settling of former convicts and free settlers. This unique history in the Pacific region has created a specific set of heritage remains but is also still today at the core of Indigenous claims for independence. The paper will present the development of this extreme case of a colonial legacy in the 21st century.

Sanders, Mariana (University of Guam), John Peterson (University of Guam) and Stephen Acabado (University of Guam)

[7] *Geoarchaeology in the Philippines: Connecting People to their Landscapes*

The landscape of the Ifugao (northern Philippines) presents an opportunity to examine the range of soil types in the development of a terraced-rice agricultural system. Based on ethnographic information, it is widely known that the construction of rice terraces in Ifugao is the culmination of a pattern in land use across time. A particular rice terrace system could have started as a managed forest, then the vegetation cleared for swiddening, and then depending on the availability of irrigation source, the swidden field could be converted into a permanent terraced rice paddy. Examining buried soil profiles and analyzing soil characteristics can evaluate these changes in land use. As a case study, this presentation illustrates the different activities that created three (3) A Horizons in the Old Kiyyangan Village (an early Ifugao settlement dated at ca. 1000 YBP). These buried soil profiles suggest several occupation periods as well as abandonment episodes, as the horizons were separated by thin (ca. 2cm) films of sand deposits, suggesting ponding events. Since the site is close to two river systems, we hypothesize that high velocity flooding triggered the abandonment episodes.

Sanders, Thomas

[94] *When Archaeologists Play Well With Others*
 Dakota scholars and non-Dakota archaeologists, working together for fourteen years as equals have uncovered over 2500 petroglyphs, a sophisticated astronomical observatory, and a women's ceremonial site along Southwest Minnesota's Red Rock Ridge. Also they have managed as a team of equal partners the Minnesota Historical Society's Jeffers Petroglyphs Historic Site. Their efforts have produced a Ceremonial Use Protocol to guide sacred use of the site and multi-disciplinary public education programs on archaeology, astronomy, prairie ecology, geology, American Indian culture, and, of course, the site's petroglyphs. This team has built strong relationships with federal and state agencies, the Nature Conservancy and Southern Minnesota Construction's Sioux Rock Quarry. This talk will present the methodology of this team and the implications this work has for the management of sacred sites.

Sanders, Mark (University of Denver)

[152] *Chair*

Sanders, Donald (Institute for the Visualization of History, Inc.)

[247] *Virtual Heritage: Researching and Visualizing the Past in 3D*

Understanding the distant past isn't easy; we weren't there. The discipline of Virtual Heritage has emerged to remedy that situation by demonstrating the many benefits of building interactive, 3D, computer-generated visualizations of historical settings, events, and cultures. Virtual Heritage professionals pursue their re-creation goals, because new insight invariably results when researching and imaging the past interactively and in 3D. After all, the past happened in 3D; so that's the way it should be studied. I will discuss (and show) examples of the archaeological sites and problems we have worked on using virtual reality for hypothesis testing, digital publication, and museum display. I will also discuss a paradigm shift about to hit archaeology, one that promises a means for keeping all of its processes digital from excavation recording, to integrated data analysis, to 3D visualizations, and information dissemination by using only a single piece of free software (and meaning that no scanners, no total stations, and no architects are needed).

Sanderson, David [147] see Hauser, Neil

Sandgathe, Dennis [183] see Tarle, Lia

Sandrock, David [213] see Perkins, Leslie

Sandweiss, Daniel (University of Maine)

[26] *Discussant*

Santacruz Cano, Ramón [231] see Lopez Corral, Aurelio

Santangelo, Antonia (The Graduate Center, City University of New York)

[263] *Don't Step on the Scale: Weighing the Challenges and Rewards of Archaeologically Obtained Fish Scales with a Report from Eastern Crimea*

Current literature reveals that it is possible to infer the season of site occupation and the growth history of fish by analyzing scales, but oftentimes there are a number of limitations facing the archaeologist when attempting to determine such details. This paper will outline the theoretical reasons for and the methods behind identifying, analyzing and using archaeologically retrieved fish scales to their fullest potential, while highlighting new practical solutions and reflections on the inherent challenges. Preliminary research on fish scale remains from archaeological investigations in Eastern Crimea will be presented as a case study.

Santarelli, Brunella (Arizona State Museum, University of Arizona), Christina Bisulca (Department of Conservation, The Bernice Pauahi Bishop Museum) and Nancy Odegaard (Arizona State Museum, University of Arizona)

[139] *Investigation of Basketmaker III Lead Glaze Technology in the Southwest*

The earliest glazes in the Southwest appeared during the Basketmaker III period in the Four Corners as vitrified pigments, coinciding with the local invention of pottery in the region. In the 1930s Anna Shepard identified the paints on Basketmaker III ceramics from the site of La Plata as glaze paints, and using spectrographic analysis determined they were lead glazes. Since this time, there have been no reported technological studies addressing how these glazes were made, and what their presence indicates archaeologically. A survey of Basketmaker III ceramics was undertaken at the Arizona State Museum (ASM) to determine the extent of lead glazes on these ceramics using non-destructive techniques, including portable X-ray fluorescence and micro-chemical tests. This paper will present the results of this survey of nearly 300 Basketmaker III whole vessels, which has shown that the use of lead glazes is more widespread than previously thought. Preliminary compositional and structural analysis with scanning electron microscopy/energy dispersive spectroscopy and electron microprobe are also provided, which give insight into the early manufacturing techniques of these glazes.

Santarone, Paul [281] see Neff, Ted

Santiago, Emilio (Columbia University) and Severin Fowles (Barnard College, Columbia University)

[85] *The Evolution of Moieties in the Northern Rio Grande: New Evidence from the El Bosque Site*

Recent investigations at the El Bosque Site in the Embudo Valley, New Mexico, raise new questions about the evolution of moiety organization in the northern Rio Grande Valley. The El Bosque Site is a previously unrecorded large 13th century village with hundreds of multi-story rooms organized into a dual division that is similar to, but more complex than, the dual organization at nearby Pot Creek Pueblo. As such, it provides the earliest strong evidence for village-level moieties in the Rio Grande Valley, apparently introduced by recent Tanoan-speaking immigrants from the west. Here, we report on Columbia University's recent research at El Bosque, providing the first maps of its architectural

layout, surrounding network of shrine boulders, and viewsheds, and we consider the implications of the site for our understanding of the origins of Eastern Pueblo moieties.

Santini, Lauren (Harvard University)

- [21] *The Fabricated Forest: Reconstructing Ancient Human Intention, Cultural Behaviors, and Effects on the Development of the Modern Forest through the Lens of San Bartolo/Xultun*

Trees hold an integral place in countless social practices around the world. To sustain the cultural behaviors that rely on arboreal resources, tree species must be sustained and cultivated through careful management practices. It follows that if there is some consistency of human behavior over time, that this should be reflected in the forest because of sustained maintenance, and detectable in the archaeological record. This paper reviews the first steps in testing hypotheses surrounding the link between ancient human behavior and tree management in Late Preclassic and Classic residential units around San Bartolo and Xultun begun in the spring field season of 2012. Using a combination of soil analysis (phosphorus, phytoliths), charcoal analysis, and modern tree species survey, this project seeks to establish correlations between ancient residential behaviors, evidence of the ancient tree species composition, and the present day species composition. Ultimately, this project will explore how the residents of the San Bartolo-Xultun region interacted with the forest that they inhabited, and in so doing will bring life to the aboraculturalists of the Maya Preclassic, situating them within the context of their environment.

Santoro, Calogero [26] see Standen, Vivien

Sappington, Robert (University of Idaho) and Laura Longstaff (University of Idaho)

- [128] *Recent Investigations at the Kelly Forks Work Center Site, North Central Idaho: New Insights into 12,000 Years of Interaction between the Columbia Plateau and the Northwestern Plains*

University of Idaho archaeologists conducted field schools at Kelly Forks Work Center, a multi-component site (10CW34) at the confluence of Kelly Creek and the North Fork of the Clearwater River on the Clearwater National Forest, from 2010 to 2012. A series of more than twenty radiocarbon dates, beginning at ca. 10,680 B.P. (Cal B.P. 12,820), document recurring occupations from the Windust phase into the historic period. Concentrations of Windust phase and Cascade phase flaked lithic tools, plus anvils, net weights, and shaft abraders were recovered, indicating that onsite activities included tool manufacture and modification, fishing, hunting, and animal processing. While most cultural materials are comparable to those from the southern Columbia Plateau, lithic tools similar to styles from the northwestern Plains, including an early Paleoindian Goshen point and late prehistoric Avonlea points, were also recovered. Protein residue analysis from a variety of tools and features has identified bison, rabbit, human, and beaver/porcupine antisera. X-ray fluorescence has identified obsidian and vitrophyre items from multiple sources in Montana, Idaho, and Oregon. Kelly Forks represents a significant setting in the northern Rockies at the interface between the Columbia Plateau and the Plains that was used intermittently for more than 12,000 years.

Sassaman, Kenneth (Univ of FL - Anthropology) and Asa R. Randall (University of Oklahoma)

- [65] *Abandonment as Historical Practice: Futures Past in Ancient Florida*

To the historically conscious, abandonment is the transformation of past presents into futures past, or simply the genesis of historical resources for enacting alternative futures. In this sense abandonment is strategic, purposeful, and generative of one's sense of identity. To abandon a place, a practice, or even an

entire way of life is to relocate the past in relation to possible futures. Detachment from place is thus an eventful rupture in time, the point at which change is enacted and history is conceived. Abandoned places are mobilized as symbolic capital in the memories they invoke, the commemorative practices they evoke, and in the enchainment of persons and things with which they come to be associated. Two cases studies from peninsular Florida showcase the futures past of abandoned places. In the St. Johns River valley of northeast Florida, inhabitants of the mid-Holocene enjoined abandoned places to negotiate alternative futures in the ever-changing relationships among people, water, substances, and things. On the northern Gulf Coast of Florida, fluctuating sea levels over the past four millennia made shoreline sites vulnerable to transgression or regression, but they also encouraged coastal dwellers to enchain past, present, and future places as a form of cultural resiliency.

- [101] *Discussant*

Sato, Hiroyuki [28] see Morisaki, Kazuki

Sato, Takao (Keio University, Department of Archaeology and Ethnology)

- [141] *Discussant*

Saturno, William

- [64] *Grasshopper's Long Jump: Exploration, Archaeology, and Education in the Northeast Petén, Guatemala*

There was a time, now in my ever more distant past, when Cibecue, Arizona was the most exotic place I ever intended to go. My prospect of joining a cohort of students for a summer in the wilds, a summer of learning and discovery was almost the only thing I could speak of to any that strayed within earshot. My time at Grasshopper was formative, and though it was my first such adventure it was not to be my last. In the intervening decades I have journeyed into places considerably more wild, and in the company of a great many cohorts of students. These subsequent journeys however have all been shaped and colored by those six weeks at Grasshopper and those professors and students alike who brought me into the fold. This paper recounts some of my more memorable formative experiences at Grasshopper and how they have resurfaced in interesting and often unexpected ways in my subsequent archaeological endeavors in Guatemala, Peru and Cambodia.

- [21] *Discussant*

Saturno, William [21] see Rivera Castillo, Patricia

Saul, Hayley [258] see Nishida, Yastami

Saunders, Katie [41] see Benson, Lisa

Sayer, Duncan (University of Central Lancashire)

- [55] *More than a Mother: Witnessing Multi-Scaled Funeral Dramas in Early Anglo-Saxon England*

Early Anglo-Saxon cemeteries have received considerable scholarly attention since their identification by antiquarians. This situation can be understood in part because of the rich variety of artifacts recovered from graves. However, these objects have often dominated discussions to the exclusion of other important considerations; for example, it was not until the 1970s when grave plans started to be routinely published as part of excavation reports. This paper will present some results from the ongoing excavations at Oakington, Cambridgeshire, and will use compound methods including reconstruction drawing, artifact

comparison, skeletons and grave plans, to explore the rich context of funeral construction. In addition, it will investigate funerals where community performance is used to define social connectedness and allow the renegotiation of local and regional identities. Burial events appear to have functioned at multiple scales and were probably key elements used in the development of personal and community mythology during the 5th and 6th centuries A.D. when local tribes laid the foundations for regional kingdoms.

Sayre, Matthew (University of South Dakota)

[100] *Family, Markets, and Poverty in the Preconquest Andes*

In the pre-Conquest Andes, a poor person was traditionally defined as someone who lacked relatives. The communal nature of labor and group obligation implied that those without family connections were poor. However, when we examine the archaeological record poverty may be visible in more material terms. In attempting to examine poverty at the 3,000 year-old site of Chavín de Huántar in Peru, I examine evidence from both the monumental center of the site as well as the La Banda domestic settlement area located across the Mosna River from the main temple complex. The site itself was constructed at a point in time when hierarchical roles were becoming entrenched and as such it provides a relevant example for discussions of poverty, power, and the possible roles of markets. Artifactual, architectural, and iconographic evidence will be analyzed in order to discuss whether or not poverty, as currently understood, could only be defined in material terms in the capitalist era or whether long-term analysis of concepts of value and inequality can also reveal and critique poverty in early sedentary societies.

Sayre, Matthew [180] see Lopez-Munoz, Marisol

Scarborough, Vernon [273] see Isendahl, Christian

Scardera, Francis

[18] *Evidence for Rock Art amongst the Haudenosaunee*

The Northeast, specifically Iroquoia, has often been considered by some as a "petroglyph black hole." The debate continues over whether there is sufficient evidence for the widespread prevalence of rock art amongst the Haudenosaunee during both historic and pre-contact times and how these representations manifest themselves onto the cultural landscape. The following paper reviews both the archaeological record and historical references of rock art sightings in Iroquoia. Furthermore, assigning cultural affiliations to rock art in the Northeast remains an arduous task as these cultural landscapes may represent works of several groups. The confusion over linguistic and cultural identities in early historical accounts, combined with the complexity of migratory routes should provoke discussion of single cultural group designations. In order to better understand art as displayed in the Haudenosaunee landscape, we must broaden our definition of rock art, particularly the medium. Proposed is a paradigm shift from a focus on a single medium – rock faces – to a larger cultural landscape where consideration is given to other less conspicuous media that may have eluded the archaeological record.

Scarre, Chris

[96] *Places Apart? Islands, Monuments, and Movement in Neolithic Northwest Europe*

Islands have a special status in archaeology as places where things were sometimes done differently. That is exemplified by their high densities of monuments of a funerary or ritual nature, that often far exceed those of adjacent mainland. These high densities are characteristic not only of Malta or Rapa Nui, but also of many of the islands around the coast of northwest Europe: Orkney, Scilly, the Channel Islands and Molène. Why were these

islands special, and how do their high densities of Neolithic monuments (4500-2500 B.C.) fit within the broader social and symbolic landscape? This paper explores the connection between the islands and the adjacent coasts of Britain and France, and seeks to contextualize them within patterns of human movement revealed by artifact flows and stable isotopes. If prehistoric populations were more mobile than has hitherto been believed, then monument densities may reveal islands not as the refuges of isolated communities but as sought-for destinations by pilgrims and travelers. The study draws on recent fieldwork in the Guernsey archipelago but places it within a broader global perspective.

[96] *Chair*

Schaaf, Peter (Instituto de Geofísica, UNAM), Gabriela Solís-Pichardo (Instituto de Geología, Universidad Nacional Autónoma), Peter Horn (Bayerische Staatssammlung für Paläontologie und Ge), Teodoro Hernández-Treviño (Instituto de Geofísica, Universidad Nacional Autónoma) and Linda R. Manzanilla (Instituto de Investigaciones Antropológicas, Unive)

[17] *Methodological Advances in Human Migration Studies Using Sr Isotope Ratios*

Sr isotope data are widely used in anthropological sciences to trace human migration histories from ancient burials. Bone Sr approximately reflects the isotopic composition of the geological region where the person lived before death, whereas tooth enamel Sr is thought to remain as a closed system and conserves the isotope ratio acquired during childhood. Until now, tooth enamel was considered to be less sensitive to secondary Sr contamination due to higher crystallinity and larger sizes of the biogenic apatites in comparison to that in bone and dentine.

We present a new pretreatment and leaching protocol for Sr isotope determinations on tooth enamel samples. The results of our investigations emphasize the importance of a three-step leaching procedure with different concentrations of acetic acid. Eight examples from Teotihuacan, central Mexico, demonstrate that enamel 87Sr/86Sr without leaching can show correct biogenic values, but there is also a considerable probability for these values to represent a mixture of original and secondary Sr without significance for migration reconstructions. We thus highly recommend the application of this leaching procedure to any Sr isotope analysis on tooth enamel samples.

Schaaf, Peter [17] see Solis-Pichardo, Gabriela

Schachner, Gregson (UCLA)

[67] *Forging New Intellectual Genealogies in Southwest Archaeology*

The last twenty years have been a time of significant change in Southwest archaeology. One of the most important has been a shift in the training and experience of students, who now often have the opportunity to work closely with American Indian archaeologists, elders, and cultural preservation specialists. Not only has this shift precipitated a transformation in how our research is conducted, but it has also changed the types of questions we ask and improved our understanding of the ancient past. In this paper, I explore the effects of these changes and how they will shape the intellectual histories that will be written in the future about this crucial time in Southwest archaeology.

Schacht, Robert (Northern Arizona University)

[30] *Henry Wright and Landscape Archaeology on the Susiana Plain*

Before the Iranian Revolution, the plains of Upper Khuzistan were a focus of archaeological investigation. Most attention has been devoted to the northern plains. The southwestern plain, with the Karkheh River on the West, and the Dez River on the East, was explored by Robert McC. Adams (1961), Elizabeth Carter (1971), and briefly by Robert Schacht (1974). In 1977, Michael Kirkby

proposed that a major change in the course of the Karkheh occurred about 500 AD from a course across the north side of the SW plain, into its modern course. No major archaeological work has been conducted in the southwestern plain since the Iranian revolution of 1979. In 2003, a special workshop on Landscape Archaeology in Greater Mesopotamia hosted by the Oriental Institute was held at the University of Chicago. This workshop reviewed modern methods and techniques, including satellite imagery. Attending this workshop inspired a review of the evidence from Southwest Susiana, where about 20 Elamite (1900–500 B.C.) sites have been identified. Since this area is today too dry for rainfall agriculture, evidence for irrigation canals drawn from the current bed of the Karkheh was examined, regarding Kirkby's hypothesis.

Schaefer, Michael (University of Wisconsin-Madison) and Fernanda Neubauer (University of Wisconsin-Madison, CAPES Foundation)

[50] *Sacred Cuisine: Culinary Practice at Maranga, Central Coastal Peru*

In this paper, we present our use-alteration analysis of cooking pots from Huaca Aramburú in central coastal Peru. There, in the ancient urban center of Maranga, Late Intermediate period mortuary cuisine is represented in food offerings accompanied by the cookware used to prepare and serve funerary and sacrificial rituals. Our results indicate that the most common dishes at these rituals were stews and soups, which are also the most common foods consumed by families in their everyday lives. In this way, a memory of the sacred and the past accompanied the living through meals of stews and soups in everyday life and during religious ceremonies, raising the significance of the daily meal above mundane subsistence; the soups and stews of the coastal culinary traditions symbolically bonded the realms of the living to the dead and perpetuated the memory of ancestors and deities.

Schaefer, Jerry [77] see Daniels, James

Schaffer, William (Arizona State University)

[115] *Reconstructing Identity and Mortuary Ritual at Historic Kormantse, Central Region, Ghana*

Bioarchaeological evidence from the historic site of Kormantse in Ghana has the potential to inform us of many details concerning the life histories and deathways of West African peoples amid colonial interaction. This presentation attempts to reconstruct the funerary landscape at Kormantse using a suite of data pertinent to mortuary traditions and customs as well as skeletal indicators that interpret biological profiles, overall health and nutrition. This information will then be employed with peripheral ethnographic and historical references in order to make inferences about the formation and maintenance of identity persisting during site occupation. The unraveling of these aspects of identity should seek to emphasize the essential components necessary for successful transmission of cultural knowledge and concepts of heritage critical for community cohesion. The implications of this research include the contribution of comparative elements for use in future studies of cultural transformation during colonial West Africa and Diaspora societies.

[115] *Chair*

Schallin, Ann-Louise (Swedish Institute at Athens)

[61] *Rituals and Ceremonies at the Mycenaean Cemetery at Dendra*

Axel W. Persson, the first excavator of the Dendra cemetery in the Argolid, presented his explorations in two volumes, which were published ca. 70 years ago. His excavations comprised a Mycenaean tholos tomb and a number of chamber tombs. From his detailed accounts, it appears that the tombs contained a rich material and moreover, the cemetery offers valuable information concerning ritual activities associated with the burials, which has

been confirmed in later investigations. The present paper aims at presenting the chronological development of the Mycenaean cemetery at Dendra on the basis of the available evidence and moreover, an analysis of part of the evidence set against its regional, ritual context will be undertaken. Furthermore, the possible links between the burial ground at Dendra and the citadel site at nearby Midea will be considered.

Scham, Sandra (University of Maryland)

[257] *Heritage and Cultural Diplomacy*

Former Ambassador, and archaeology enthusiast, Thomas Pickering famously quipped "In archaeology you uncover the unknown. In diplomacy, you cover the known." The relationship between archaeological sites and diplomacy is closer and more fraught, however, than Pickering's humorous contrast would suggest. From the use of archaeological backdrops for state visits, to sites caught in the cultural crossfire, to bitter battles over ancient sacred spaces, we have recognized that archaeological sites are caught up in foreign policy debates for some time. Our interest in this phenomenon as archaeologists should be less about decrying the use of sites for political or nationalist purposes and more about determining what effects all of these connections will have on the management and interpretation of sites in the future. This paper suggests an approach to the presenting, interpreting and educating students and the public about the significance of sites in cultural diplomacy.

[282] *Moderator*

Schamens, Nicholas [243] see Scharf, Elizabeth

Scharf, Elizabeth (University of North Dakota) and Nicholas Schamens (University of North Dakota)

[243] *Pollen and Sediment Samples from the Swamp West of Mound A at the Poverty Point Site, Louisiana (16WC5)*

Poverty Point (West Carroll Parish, Louisiana, USA) is an unusual site, as it was inhabited up to 3,700 years ago by hunter-gatherers who were sedentary, constructed monumental earthworks, obtained exotic lithic raw materials, and created ceramic objects. This paper presents results from an analysis of a sediment core taken in the low swampy area west of Mound A, the "Bird Mound." Information on pollen preservation, pollen identification, lithology, dating, and magnetic particles will be presented and used to construct an environmental context for the site. This, in turn, will provide insight into past vegetation, landscape changes, and human action spanning several thousand years at Poverty Point.

[243] *Chair*

Scharlotta, Ian [291] see Becker, Mark

Schattenburg-Raymond, Lisa [5] see Bisulca, Christina

Scheinsohn, Vivian (INAPL-CONICET/ University of Buenos Aires), Paula Miranda (INAPL-CONICET), María José Fernández (INAPL), Agnolin Agustín (INAPL) and Carpio Mariela (INAPL)

[168] *An Argentinean Metarchaeology: Lessons Learned from an Anthropological/Archaeological Collection*

Since 2010 we are conditioning and inventorying an anthropological collection located at the Argentinean Museum of Natural History (MACN) located in Buenos Aires city. This was the first museum of Argentina, created in 1812. At the beginning the museum covered anthropology and archaeology research but in 1947 its Anthropology section, along with its materials, was transferred to the Ethnographic Museum at the University of

Buenos Aires. However, for some unknown reason, part of these materials remained at the MACN, ignored by most anthropologists and archaeologist ever since. This collection includes catalogued material, mostly from the expeditions of Florentino and Carlos Ameghino, and uncatalogued material, both with great potential given the new perspectives and techniques available today. In this paper we will analyze the challenges and limitations this collection posit to archaeological and anthropological research.

Schieppati, Frank [18] see Hayward, Michele

Schilt, Flora [76] see Thompson, Jessica

Schleher, Kari (Crow Canyon Archaeological Center), Kevin Brown (The University of New Mexico) and Jamie Gray

[86] *Experimentation in Pottery: A Preliminary Analysis of Basketmaker III Pottery Production in the Mesa Verde Region*

The Basketmaker III period (A.D. 500–750) was an exciting time in the history of pottery production in the American Southwest. This period saw the beginning of widespread pottery manufacture in the northern Southwest, including the Mesa Verde region, and the transition from brown ware (made from alluvial, sandy clays) to gray ware (made from finer geologic clays). Here, we present preliminary data on pottery from the Basketmaker Communities Project (BCP) and the results of a pottery resource survey of the area. In the analysis of archaeological sherds, we identified a range of materials used in vessel manufacture. This suggests that potters were using a variety of clays from both alluvial and higher-quality geologic sources and different kinds of tempering materials, including sand and crushed igneous rock. The variety in raw materials used by past potters may suggest experimentation with different materials, as potters tried to perfect the new technology. Conversely, these data may suggest that raw materials or vessels were being brought in from other areas. In the pottery resource survey, we identified many sources of local clay, including alluvial and geologic clays, which may have been used by potters in the area during this experimentation phase.

Schleher, Kari [267] see Eckert, Suzanne

Schloen, David (University of Chicago) and Sandra Schloen (University of Chicago)

[247] *Organizing and Integrating Archaeological Data*
In recent years, new technologies have been widely adopted in archaeology to enable rapid acquisition of data about archaeological finds and their spatial and stratigraphic contexts. For example, archaeologists now routinely use state-of-the-art equipment to obtain detailed 3-D imagery and geospatial data, and they increasingly rely on instrumental data about the chemical composition and internal structure of artifacts and soil deposits. However, the growing body of diverse data at our disposal increases the need for software that can manage and integrate disparate sources of archaeological information in way that facilitates data sharing and analysis, both within and across projects. The "Online Cultural and Historical Research Environment" (OCHRE) is a multi-project, multi-user online database system developed and tested over the past several years to meet this need. In this paper we will present the main features of the software and some examples of its use.

Schloen, Sandra [247] see Schloen, David

Schmidt, Morgan and Joshua Toney (bJoint POW/MIA Accounting Command)

[60] *Dark Earths and the Human Built Landscape in Amazonia: The Social Implications of Anthrosol Formation*

Anthrosols known as Amazonian Dark Earth (ADE) or terra preta are part of the ancient human built landscape representing valuable landscape capital created through chiefly labor control. Their formation is patterned around habitation areas, public areas, and routes of movement, all evidence of a highly organized social structure that is reflected in both landscape and material culture. New data from excavations and topographic mapping, including soil and pottery analyses, from sites in separate regions of Amazonia, demonstrate a widespread pattern of terra preta formation in circular mounds surrounding flat terraces that extends across prehistoric settlements. Results show the interrelationship of residential and public areas, anthrosols, routes of movement, natural resources, and material culture allowing for comment on the relationship between subsistence and social organization in the Amazonian past.

Schmidt, Peter (University of Florida)

[223] *Emerging Female Subaltern Histories in Tanzania: an Unforeseen Consequence of the HIV/AIDS Epidemic*

Oral tradition research at a major archaeological site in Tanzania—long known for its rich oral traditions—has uncovered potent and previously unknown subaltern histories about a prominent female ritual office heretofore obscured by dominant male voices that formerly guided male investigators. Interviews conducted by local residents have unveiled information about a woman who assumed a key ritual office as a virgin in 1900 at age 12 and was married for life to Rugomora Mahe, a 17th century king. In this role she conducted new moon (renewal) ceremonies, communicated with the spirit of the dead king/husband (who visited her as a snake), was accorded kingly respect, and oversaw the king's burial estate. Decades of earlier research revealed nothing about this important office. Oral histories about the last office holder emerged in testimonies of female elders who have replaced male keepers of oral tradition, one of the consequences of the HIV/AIDS epidemic, which has taken a disproportionate number of elderly males. Now respected as history keepers, elderly women discuss this office as part of their common sense discourse on village life, transforming and adding powerful new interpretative narratives about the archaeological site shared during heritage tours organized by the community.

Schmidt, Caroline [284] see Ortmann, Anthony

Schneider, Seth (University of Wisconsin-Milwaukee)

[25] *Oneota Interaction among Three Localities in Eastern Wisconsin: Ceramic Compositional Analyses of Six Oneota Pottery Assemblages*

Eastern Wisconsin contains a series of late prehistoric (A. D. 1200–1400) Oneota site clusters (localities) separated by distances of up to 50 km. Little work has been done to determine the amount of inter-regional social interaction that took place by groups living in these localities. Although a general stylistic homogeneity exists among all localities, sites within each locality show individuality. Energy dispersive x-ray fluorescence is combined with ceramic petrography to investigate whether some ceramic vessels were physically moved across the landscape or if potters in each locality made their ceramics locally. Pottery from six ceramic assemblages that come from sites in three localities in Eastern Wisconsin, as well as clay samples from each locality were examined using a Bruker Tracer III-V+ portable X-ray fluorescence analyzer (pXRF) and ceramic petrography. Analysis of these assemblages combined with pXRF data on clay sources is used to discuss whether actual ceramic vessels, not just ideas of ceramic style, were transported across Eastern Wisconsin during the Oneota Tradition.

Schneider, Seth [25] see Richards, John

Schneider, Joan and Yadmaa Tserendagva (Mongolian Academy of Sciences, Institute of Archaeology)

[240] *A First View of a Mongolian Archaeological Landscape in the East Gobi Desert: Preliminary Results from an In-Progress Random Sample Inventory within Ikh Nartii Chuluu Nature Reserve*

This paper reports the first systematically acquired archaeological data from Dornogovi (East Gobi) Province of Mongolia. A random-sample intensive pedestrian survey strategy has been applied during three field seasons of archaeological work within Ikh Nart Nature Reserve in Mongolia. Whereas this entire region has previously been overlooked in favor of more intensive archaeological research in the northern, central, and western regions of Mongolia, our work indicates that the wide range of site types, the chronological time span represented, and the density of archaeological sites in this region of Mongolia will bring greater focus to this area in the future. As a work-in-progress, the results to-date indicate that sites range from those of Neolithic through the Mongolian Empire and Tibetan Buddhist eras and vary from quarries, to burials, to residential encampments, to built environments. The richness, variety, and relatively pristine nature of the archaeological record within Ikh Nart provides many research opportunities as well as an opportunity to protect and preserve a unique and relatively pristine cultural heritage landscape within a Mongolian "protected area."

[240] *Chair*

Schneider, Tsim (Pacific Legacy, Inc.) and Lori Hager (Pacific Legacy, Inc.)

[248] *Stories from Stone, Bone, Shell, and Glass: Digital Imaging and the Analysis of a Bead Assemblage from the Napa Valley, California*

In 2007, 2009, and 2010 data recovery excavations took place at a predominately prehistoric archaeological site in the Napa Valley, California. Field investigations encountered 162 human burials and a large assemblage of flaked stone tools, groundstone implements, bone tools, and a robust assemblage of beads, including examples manufactured from steatite (soapstone), bird bone, Olivella biplicata and abalone shell, and glass. Following an overview of the project and the artifact assemblage, our paper focuses on the bead assemblage and especially forty-one steatite disc beads. Analysis of the stone disc beads initially involved routine measurements that show three distinct size classes, each associated with different contexts: an excavation unit and two separate burials. To test whether the distinct stone bead size classes reflect individual preferences—as opposed to the more structured production of Olivella bead types seen throughout California—we employ Reflectance Transformation Imaging (RTI), a digital imaging method that renders three-dimensional data from two-dimensional digital photographs, to identify unique manufacturing signatures. Our findings are reported and we discuss the significance of the RTI study vis-à-vis the shell bead industry, obsidian procurement and biface production, and the mortuary practices represented at the site.

Schnick, Brian [206] see Hudson, Erin

Schnieder PhD, Joan [265] see Hadel, Patrick

Schoeninger, Margaret (UC-San Diego)

[17] *Discussant*

Schoeninger, Margaret [138] see Somerville, Andrew

Schollmeyer, Karen (Arizona State University)

[89]

Faunal Diversity, Resilience, and Social Transformations in the Prehistoric U.S. Southwest

Faunal resources were an important component of the largely agriculture-based diets of prehistoric Southwestern farmers. This study examines the relationship between diversity in human use of animal resources, resilience, and periods of social stability and change in the case study areas of the Long-Term Vulnerability and Transformation Project. Although the caloric contribution of meat to the prehistoric diet in these case studies was small, some animals made essential nutritional and social contributions. I apply several indices and diversity measures in order to assess the resilience of different animals to human hunting in the case study areas over time; the diversity of animal resources available to hunters in these areas and temporal changes in that diversity; and the relationships between these two factors and archaeologically visible periods of social stability and social change within the case study societies. Results are linked to broader theories concerning the relationship between diversity and resilience in social-ecological systems.

Scholnick, Jonathan (Simon Fraser University), Briggs Buchanan (University of Missouri and Simon Fraser University) and Mark Collard (Simon Fraser University)

[158] *An Evaluation of the Impact of Population Size on Cultural Diversity Using Colonial-Era New England Gravestones*

Recent theoretical and modeling work suggests that population size influences cultural evolution. The work in question indicates that larger populations can be expected to have larger and more complex cultural repertoires than smaller populations. However, empirical tests of this hypothesis have yielded conflicting results. Some researchers have found that cultural diversity and complexity increases with population size, but others have failed to find a relationship between population size on the one hand, and cultural diversity and complexity on the other. Here, we evaluate the population size hypothesis with two datasets: Colonial-era North American baby names and gravestone motifs. The data are derived from approximately 10,000 seventeenth- and eighteenth-century gravestones located in 50 Massachusetts burial grounds. The results of the analyses are consistent with the predictions of the population size hypothesis. Both the number of novel baby names and the number of novel gravestone motifs increase with population size. Our study supports the idea that population size affects cultural evolution in pre-Industrial farming societies.

[158] *Chair*

Scholz, Elizabeth A. [33] see Wales, Susannah

Schopf, Paul [23] see Rogers, J. Daniel

Schortman, Edward [140] see Urban, Patricia

Schortman, Edward (Kenyon College) and Patricia Urban (Kenyon College)

[287] *Networks, Power, and Communities: Performing Social Unity among Households in the Terminal Classic Naco Valley, Northwestern Honduras*

Households and communities figure prominently in many analyses of past political processes. This approach profitably directs attention to how power relations are shaped from the ground up and are not just imposed by elites. As valuable as this perspective is, we suggest that households and communities are themselves the variably enduring outcomes of shifting alliances forged by people organized in social networks. These webs are central to the study of power contests because it is through them that conceptual and tangible resources used in advancing and

challenging claims to preeminence are marshaled. Attention to social nets also highlights the ways in which even residents of the same compound can be divided by allegiances to different associates residing at variable distances from whom goods and ideas crucial to the achievement of preeminence are differentially secured. In this paper we provide an example of how a community composed of six households in the Naco valley, northwestern Honduras was simultaneously united and riven by interactions conducted among its members during the 8th-10th centuries. The importance of craft production in both creating and dividing this aggregate is emphasized as are the general implications of this approach to the study of past socio-political processes.

Schott, Amy (University of Arizona)

- [184] *Geoarchaeology and Dune Stability in Petrified Forest National Park*

Geoarchaeological methods are used to investigate the relationship between dune stability and archaeological site distribution in the Petrified Forest National Park. Dunes are examined in two areas: the first area includes many small Pueblo I period sites located at various depths in dunes surrounding the Twin Buttes site, a large Pueblo I period habitation site. The second area includes fewer archaeological sites in dunes surrounding, and possibly associated with, the Flattops Village, a large Basketmaker II-III period site. Geoarchaeological methods are used to examine sand dunes in these two areas to determine periods of dune stability indicated by the presence of soils and weathering. The distribution of soils is compared with the distribution of known archaeological sites to determine the relationship between periods of stability, indicated by soils, and patterns of occupation. The hypothesis is that more intensive use of the landscape corresponds to periods of landscape stability. This research contributes to our understanding of human use of the landscape, Late Holocene landscape evolution and environmental changes, and site formation processes within dunes.

Schoville, Benjamin (Institute of Human Origins, Arizona State University), Erik Otarola-Castillo (Iowa State University/Harvard University) and Jayne Wilkins (Arizona State University)

- [76] *Early Human Occupation Potential across Africa during Marine Isotope Stage 6 (MIS6): A Species Distribution Model Using Maximum Entropy*

Recent genetic and fossil evidence places the origins of the modern human lineage and anatomy at ~200-150ka ago in Africa. This time period is encompassed by MIS6, a long-lasting glacial phase which is estimated to have caused widespread aridity in Africa. Archaeological sites that date to this time period are uncommon. A single population origin model presumes that one region in Africa had high probability of supporting a population during MIS6 that led to all humans alive today and predicts population separation. An alternative multiple populations model argues for population interconnection throughout Africa during the evolution of modern humans. This model predicts multiple connected regions of high probability for population occurrence. To test these competing models, a Maximum Entropy species distribution model (SDM) using presence of recent hunter-gatherers during the Holocene are projected to a glacial period in Africa (LGM) to approximate MIS6 conditions. The model performs well compared to a random prediction model (AUC=0.784). The predicted glacial SDM suggests that widespread areas in Africa during MIS6 were unlikely to support substantial populations, consistent with the single population model. However, several large isolated regions appear to have strong likelihood of population occurrence, consistent with the multiple populations model.

Schreg, Rainer [142] see Fisher, Lynn

Schreiber, Katharina (University of California - Santa Barbara)

- [132] *Wari and the Middle Horizon: Research and Changing Paradigms over the Past Four Decades*

In 1970, Wari was thought to be a religious movement, a trading phenomenon, or perhaps a political entity, and was often confused with Tiwanaku in the south. Efforts by William Isbell, his colleagues and students, and their students over the four decades since have clarified many points while at the same time raising new questions that beg for answers. Wari is now seen as at once more monolithic and powerful than was realized in 1970, yet at the same time more diverse and varied in the intensity and nature of its interactions with people of different regions. Immense strides have been made in the study of Wari material culture, and more nuanced studies of settlement patterns, paleoethnobotany, and bioarchaeology, among others, continue to open up new vistas of this ancient society.

- [214] *Discussant*

- [132] *Chair*

Schreyer, Sandra (California State University, Fullerton) and Tricia Gabany-Guerrero (California State University, Fullerton)

- [237] *GIS and the Boundaries of Iconographic Research in Purépecha Territory (Michoacán, Mexico)*

Iconographic research in Purépecha territory has lagged behind other regions in Mesoamerica. This poster illustrates Purépecha (Tarascan) imperial boundaries and archaeological sites combined with iconographic styles in the context of Mesoamerica. Utilizing a new iconographic geo-referenced database, this research poster maps iconographic locations to identify new research questions for this region.

Schroeder, Bryon (University of Montana)

- [75] *The Village Spread: Ethnic Identity at the Edge of the Great Basin*

The goal of this talk is to provide an overview of the different approaches used to interpret ethnicity in the archaeological record. This literature and site review is placed into the context of the ethnically defined debate known as the "Numic Spread". The review has two main purposes. The first is to elucidate the manner in which ethnicity has been used and linked to the archaeological record in this specific debate, and describes how this debate fits within a larger anthropological discussion on ethnicity. The second is to place several village sites in the Wyoming region within the context of ethnicity in the archaeological record and to reexamine the appropriateness of the ethnic labels attributed to these sites. The talk concludes by addressing the manner in which ethnicity has been used to explain archaeological sites 'across the west' and finds that ethnicity in the Numic Spread is misrepresented when placed in the context of newer cultural and archaeological studies

Schroedl, Gerald (University of Tennessee)

- [261] *Enslaved Africans and the British Military at the Brimstone Hill Fortress, St. Kitts, West Indies*

Brimstone Hill Fortress (1690-1854) is a British Colonial era fortification located on the northwest coast of St. Kitts in the eastern Caribbean. In the 18th century, it became the center piece of island defenses. While serving as a refuge from foreign invasion, its massive construction and garrison projected military power to foreign enemies and provided domestic security from the threat of slave revolts. A primary research goal is to show how Brimstone Hill reflects broad patterns of British Colonial hegemony that shaped the lives of African and Creole people before and after emancipation (1834). The research focus is the multiethnic dimensions and multifaceted relationships of the forts occupants including British officers and enlisted men, Black militia, West India

Regiments, and enslaved Africans. Historic records and excavations at six locations show that enslaved Africans completed construction to accommodate a white garrison by the 1820s. By the 1790s black militia were present at the fort and soon thereafter members of the 4th West Indian Regiment were stationed there. Consistent with British colonial strategic plans in the West Indies construction was contracted to free whites and blacks and WIR troops replaced British soldiers from emancipation until the fort closed in 1854.

Schubert, Ashley (University of Michigan)

[121] *Artifacts of "Deterrence": The Materiality of Migrant Contact with U.S. Border Patrol*
Starting in the 1990's, the federal border enforcement strategy known as "Prevention through Deterrence" (PTD) began to shift undocumented migration towards more dangerous and remote desert landscapes. The material correlates of PTD include new wall and fence construction, digital surveillance towers, and a dramatic increase in Border Patrol agents on the ground. While the impact that undocumented border crossers have on the desert has received a great deal of attention, little work has focused on the archaeological fingerprint of the Border Patrol agents who pursue and detain migrants. During the 2012 field season of the Undocumented Migration Project, an archaeological analysis of multiple Border Patrol surveillance and detainment locales was carried out with the goal of better understand the impact, both environmental and social, of the cultural contact between dissimilar communities interacting on a relatively uninhabited landscape. Drawing on a combination of ethnographic observations of Border Patrol practices, interviews with migrants, and the archaeological record, we argue that the material record of border enforcement: 1) is a unique and understudied phenomenon, 2) illustrates the separately constructed identities of migrant and Border Patrol agent, and 3) offers insight into the social dynamics of this unequal (and often antagonistic) relationship.

[121] *Chair*

Schuldenrein, Joseph (Geoarcheology Research Association)

[245] *Discussant*

Schulenburg, Marcus (University of Wisconsin-Milwaukee)

[25] *Identifying Non-Local Pottery: PXRF Analysis of Two Fort Ancient Assemblages*
The Guard Site (12D29) and Taylor site (33Wa10) are large Fort Ancient villages along the Miami River Valley in southeastern Indiana and southwestern Ohio. The presence of stylistically non-local sherds in each assemblage allows each site to be examined in regards to regional interaction in the Middle Ohio Valley during the Late Prehistoric Period (A.D. 1000-1650). The study presented here is part of an ongoing project to examine these networks through the entirety of the Miami valley. This paper focuses one potential line of evidence of regional interaction: the identification of local and non-local ceramics using portable X-ray fluorescence (pXRF) techniques of clays and sherds. These data are compared with the stylistic and formal characteristics of the sampled pottery. Results are used to examine patterns in regional exchange networks as indicated through the movement of ceramic objects.

Schulting, Rick, Julie Hamilton (School of Archaeology, University of Oxford), Vladimir Bazaliiskii (Irkutsk State University, Irkutsk), Olga Goriunova (Irkutsk State University, Irkutsk) and Andrzej Weber (Department of Anthropology, University of Alberta)

[194] *Untangling Trophic Levels? Stable Hydrogen and Nitrogen Isotope Studies at Lake Baikal*

Many decades of excavation about Lake Baikal have provided one

of the most extensive datasets in the world for hunter-gatherer bioarchaeology. Here, we present the results of a stable hydrogen isotope pilot study into trophic level differences in prehistoric humans and prehistoric and modern fauna from the region. The topic is important not only for paleodietary reconstructions, but because of the need to find the best means of correcting the large corpus of radiocarbon dates on human and seal bone for the freshwater reservoir effects seen in the lake's waters. We compare the δH results of with those of δ13C and δ15N on the same samples.

Schultz, John (University of Central Florida, Department of Anthropology)

[39] *The Application of GPR for Forensic Contexts: Detecting Buried Firearms and Graves*

It can be a daunting task when forensic investigators are confronted with a search to locate buried bodies and firearms. While there are a variety of search techniques commonly employed, the use of ground-penetrating radar (GPR) has become a very important tool for forensic investigators when searching for buried bodies. Ground penetrating radar is a non-destructive search tool that preserves the site during a survey and is used prior to excavating or digging to identify smaller target areas for limited invasive testing across a larger survey. This equipment is also important to clear suspected areas so investigations can be directed elsewhere. However, there are a number of limiting factors when considering the applicability of GPR for forensic contexts such as site conditions (i.e., soil type and foliage extent) and operator experience. One primary means of obtaining experience is to construct a research site with controlled graves and to monitor the temporal grave changes with GPR. The purpose of this presentation is to discuss GPR methodology and best practices for buried body and firearm searches. Examples will be presented from forensic casework and controlled research involving detection of common forensic grave scenarios and street-level weapons.

Schultze, Carol (Historical Research Associates, Inc. Seattle, WA)

[93] *Invention of Silver Technology in the New World*

Given the abundance of high grade ores and native metals attested to by colonial Spanish miners, it remains an open question as to why the earliest Andean metalworkers chose to develop a labor intensive, multi-step industry for the refining of silver metal from mineral ores. The earliest archaeological case study in the Americas identifies a successful pyrotechnology for the refining of silver ore in place circa AD 60 - 120 at the site of Huajje in Puno Bay, Peru. This presentation uses elemental analyses of archaeological artifacts and regional study of the contexts of this early silver industry to assess the environmental, technological, and social conditions that led to invention of silver metallurgy in the New World.

Schulze, Niklas [234] see Lailson Tinoco, Becket

Schwartz, Saundra (University of Hawaii at Manoa)

[143] *Discussant*

Schwendler, Rebecca (PaleoWest Archaeology)

[259] *A Comparison of the Use of Visual Displays during Colonization*

The Magdalenian (ca. 17,000-12,000 BP) of Western Europe was characterized by significant human population movement. People formerly confined by climatic and environmental conditions to primarily northern coastal Spain and southwestern France expanded into mountainous areas and northern latitudes. These (re-)colonization episodes required adaptation to different natural

environments and depended on successful social negotiations within and between colonizing and source populations. The distinctive circulations of exotic materials, personal adornments, and unique decorated objects suggest that sizeable colonizing populations were characterized by widespread social competition, particularly using portable items that referenced knowledge of distant people and places. Once populations became well established, their use of portable visual displays decreased dramatically, sometimes to be replaced by non-portable, local landscape-based displays. To get a sense of whether this phenomenon was unique to Magdalenian Western Europe, or a more widespread characteristic of colonizing populations in general, this paper summarizes the use of visual displays by other colonizing groups (e.g., Aboriginal Australians, Paleoindians, Polynesians). It then compares patterns in the use of visual displays among the different case studies and presents implications for our understanding of social processes in colonizing populations in general, and Magdalenian Western Europe specifically.

Schwitalla, Al [12] see Ruby, Allika

Schwitalla, Al (Al W. Schwitalla Millennia Archaeological Consulting), Terry Jones (Department of Social Sciences, California Polytech) and Marin Pilloud (Central Identification Laboratory, Joint POW/MIA A)

[12] *Sociopolitical Organization and Violence in Central California: The Bioarchaeological Record*

Often overlooked in anthropological studies from the late 20th century, violence is well-attested in the ethnographic and archaeological record of central California foraging societies. Here we evaluate spatial and temporal patterns in skeletal evidence for violence from a bioarchaeological database of 16,814 individuals, representing excavations completed between ca. 1890 and 2012. Specifically, we consider correlations between frequencies and types of violence and population density, sociopolitical complexity, and relative mobility. We also evaluate patterns in the relative involvement of males, females, and sub-adults, and contrast our findings with the more well-known, and highly-reported Santa Barbara Channel.

[177] *Chair*

Sciulli, Paul W. [6] see Swisher, Kimberly

Scott, Robert [54] see Morrow, Juliet

Scott, Ann (The University of Texas at Austin)

[109] *Searching for Light Amid the Darkness: An Examination of Contemporary Ritual Behavior Among the Kaqchikel Maya in Guatemala*

Between 2001 and 2008, the author conducted an ethnoarchaeological study of Kaqchikel Maya ritual landscape and participated in dozens of ceremonies at sacred landmarks, such as caves and other natural features, located between Lake Atitlan to the west and Antigua to the east in the Guatemalan Highlands. One aspect that was central to the concerns of modern ritual specialists, but absent from archaeological consideration, was the presence of dark or negative forces inhabiting sacred landmarks. Not all sacred space inherently contains positive supernatural energy. Often negative forces may reside at locations or may be conjured by specialists conducting dark ceremonies or sorcery. The author witnessed modified ceremonies being conducted away from traditional sacred loci of sites as a means of escaping the dark forces. This presentation discusses aspects of ritual behavior that were directly related to warding off such forces and protecting the ritual specialist from them.

Scott, Randi (Forensic Archaeology Recovery (FAR))

[135] *The Human Side of Forensic Archaeology*

Something traditional archaeologists have seldom had to address are the curious eyes of family and friends of the deceased, watching as they work. Forensic archaeologists however, tend to find the families and friends scrutinizing every movement. This paper will use a case study to explore the issues forensic archaeologists encounter with families, the media, and the community during a possible forensic archaeological recovery at a crime scene. I will also discuss whether or not the forensic archaeologist should be responsible to act as a facilitator in the healing and closure process. Encounter and contend with the emotional and humanitarian side of archaeology, something archaeology has not had to do in the past.

Scott, Rachel (Arizona State University)

[211] *Agricultural Innovation, Population Growth, and Human Health in Early Medieval Ireland*

The early medieval period in Ireland (c. AD 400-1200) was one of agricultural innovation. The faunal remains suggest a diversification in livestock rearing, characterized by a decline in the importance of cattle. At the same time, cereal production appears to have increased. While pollen cores indicate the clearance of more land for farming, archaeological excavations have uncovered numerous grain-drying kilns plus both vertical and horizontal watermills. In addition, paleobotanical remains document the introduction of new crops, such as flax and legumes. Based on the evidence for land clearance along with the dating of settlement sites, several scholars have argued for a significant growth in population over the course of the first millennium A.D. Yet the human skeletal data challenge this idea of a prosperous and well-fed rural populace supported by a revolution in agriculture. Markers of non-specific stress, particularly cribra orbitalia and linear enamel hypoplasia, reveal persistent nutritional deficiencies and infectious disease. This paper investigates socioeconomic change in early medieval Ireland by using these multiple lines of evidence to explore the interrelation of agricultural innovation, population growth, and human health.

Scott, Rachel (University of Auckland) and Judith Littleton (University of Auckland)

[219] *An Investigation of Diet and Paleoenvironmental Change in Egypt ca. 4200 B.P. Using Dental Microwear Texture Analysis*

Following the construction of the monumental pyramids of Giza in Egypt (ca. 4200 B.P.) the region experienced paleoenvironmental changes resulting in a cooler, dryer climate and diminished Nile flow. It is unknown exactly to what effect this had on the people of ancient Egypt in terms of the success of crops and availability of food resources. In an attempt to understand the impact these environmental changes had on the population, the teeth of ancient Egyptians from the north and south of the country were studied using microwear texture analysis. Dental microwear texture analysis quantifies the texture of a tooth's surface using scale sensitive fractal analysis allowing information such as patterns of wear and depth profiles of microwear features (i.e. scratches and pits) to be assessed. Different foodstuffs can cause different microwear signatures on a tooth's surface during mastication and can potentially highlight intra-population differences and dietary changes over time. This research presents the preliminary results of dental microwear texture analysis of individuals who lived before, during, and following this period of paleoenvironmental change in ancient Egypt in an attempt to understand how food may have been managed over this time.

Scott Cummings, Linda [103] see Logan, Melissa

Scott Cummings, Linda (PaleoResearch Institute, Inc.), Peter Kovacik (PaleoResearch Institute, Inc.), Kathryn Puseman (PaleoResearch Institute, Inc.), Chad Yost (PaleoResearch

Institute, Inc.) and Melissa Logan (PaleoResearch Institute, Inc.)

[236] *What's for Dinner? A Record of Past Culinary Practices from the First Millennium B.C.E.*
Nepeña

Coprolites from Caylán, Peru are unique in being examined for dietary evidence using not only pollen, phytolith, starch, macrofloral, faunal, and protein residue analyses, but also infrared evidence in the organic residue signature. This suite of analyses addresses questions concerning diet and diet breadth, the importance of cultivars, integration of native/wild resources into the diet, and the presence of marine resources. Cultivars included at least maize, beans, peppers, tomato, tomatillo, canna roots, squash, guava, and cotton. Diet richness is illustrated by the variety of remains recovered from individual coprolites.

Scudder-Temple, Kelley [91] see Wirth, Cynthia

Scullin, Dianne (Columbia University)

[134] *Islands of Sound in an Ocean of Silence: Acoustics of Moche Performance Spaces*

When considering the archetypal island, a piece of dry land surrounded by water, the beach presents a seemingly physical separation between the two. Yet what truly creates and maintains boundaries are people's actions. The beach is only a boundary if you do not have a boat or do not know how to swim. A wall is only a boundary if it prevents movement or perception.

Renfrew and Bahn define an archaeological site as "a distinct spatial clustering of artifacts, features, structures and organic and environmental remains; the residue of human activity" (2000:50). Thus traditionally the boundaries of a site or a structure derive from their physical, durable remains. What then of the ephemeral, sensual boundaries such as view-sheds and auditory perception? This paper interrogates the archaeological practice of constructing the borders of sites and structures by focusing on the acoustic properties of space. The acoustic analysis of performance spaces within a variety of Moche sites on the north coast of Peru reveals a stark contrast between the physical limits of walls and stone and the auditory extent of performances. This paper will present a re-evaluation of the archaeological concepts of boundaries to include these new "islands of sound."

[134] Chair

Seager-Boss, Fran, David Yesner (Anthropology Department and Graduate College UAA,) and Daniel Stone (Field Project Supervisor Matanuska-Susitna Borough)

[137] *Knik Townsite on the Iditarod Trail*

Knik Townsite, located on the west coast of Knik Arm, became an important distribution center for the Iditarod-Innoko region. Prior to 1908, Knik was a small supply center for prospectors seeking gold in the Talkeetna Mountains and the Yentna-Skwentna River Valleys. It was not until the Iditarod trail was constructed that Knik mushroomed into an important commercial center, attracting families from outside Alaska. Natives played an important part in the local economy by acting as guides, mailmen, traders of native-made goods and as construction workers. Building of the Alaska Railroad spelled the demise of Knik. Bypassing Knik, the Railroad created new towns along the tracks. Families and businesses moved out of Knik, often taking their buildings with them. By 1918 Knik was a ghost town. Orville G. Herning, a prospector and businessman operating a mercantile store, kept a diary on daily events in Knik. With no original maps of Knik and with only two buildings extant, Herning's diaries and photographs have been an excellent resource for archaeologists interpreting the story of Knik Townsite. Miners married to Dena'ina women created an integrated population. When conducting excavations archaeologists recovered elements of both cultures.

Searcy, Michael (Brigham Young University)

[250] *Accessories of Modern Mayan Grinding Stones*

The mano and metate are seen as natural companion pieces in the archaeological record. Ethnographic resources suggest there may have been other tools associated with daily grinding activities including biconically drilled (donut) stones and wooden boards. This paper presents evidence for these findings and explores their archaeological implications. It also demonstrates the valuable information that can be gleaned from the modern Mayan groups living in Highland Guatemala today.

Sebastian, Lynne (SRI Foundation)

[110] *Flexible, Pragmatic Approaches to Historic Preservation Compliance*

Although some archaeological preservation in the US is carried out voluntarily -- and many of the nonprofits represented in this symposium have done an amazing job of encouraging such voluntary efforts -- most in situ preservation of archaeological sites (and most data recovery in lieu of in situ preservation) happens as a result of environmental and historic preservation laws. All of these efforts are paid for by the American public, either directly through tax dollars or indirectly through costs passed on by development industries. Therefore, it is important to all of us that archaeological preservation in the public sector be done effectively and efficiently. Through our continuing professional education and technical assistance programs, the SRI Foundation works with government agencies, consulting parties, and policy makers to identify and encourage smart, flexible, pragmatic approaches to historic preservation and archaeology.

Sedar, Dena

[117] *The Good, The Bad, and the Not so Ugly: A Comparative Analysis of the Poorly Provenienced Nevada State Incised Stone Collection with Incised Stones Recovered from Controlled Excavations*

A number of incised stones have been found within the Great Basin, but not all of these stones have detailed site provenience. Nearly 2,000 incised stones from Clark County, the southern-most county in Nevada, are part of the collections of the Lost City Museum and the Nevada State Museum in Carson City and Las Vegas; however, many of the incised stones within these collections have poor to non-existent provenience information. An analysis of incised stones from well documented sites throughout the Great Basin will be used to determine if the incised stones recovered from Clark County are similar to stones found in other areas. Superficial analyses can be conducted on the incised stones, but can the data obtained be used to gain additional information about the stones based on data from incised stones that were excavated in a controlled manner? This analysis will attempt to determine if useful information can be extrapolated from artifacts with dubious provenience when compared with information gathered from incised stones excavated in a controlled manner.

Sedig, Jakob (University of Colorado)

[85] *Upper Gila Revelations: Recent Work at Woodrow Ruin*

During the summer of 2012 excavations were conducted at Woodrow Ruin, the largest site in the Upper Gila Valley of southwest New Mexico. Although the Upper Gila is considered part of the Mimbres region, the Upper Gila Valley is understudied compared to the neighboring Mimbres Valley. While the prehistoric occupation of each valley between 550-1130 AD was relatively similar in terms of culture history, excavations at Woodrow Ruin revealed there were some notable differences. Perhaps the most notable was evidence of occupation during the Transitional or Mangas period, from 900-1000 AD. This long disputed period, marked by surface adobe architecture, appears to be absent in the

Mimbres Valley, but was found at Woodrow Ruin. Additionally, the preceding Late Pithouse period at Woodrow Ruin appears to be much more substantial than at most sites in the Mimbres Valley. This poster summarizes the recent work conducted at Woodrow Ruin, and focuses on data that pertains to the similarities and differences between the two valleys, especially the terminal Late Pithouse and Transitional/Mangas phases.

Seelenfreund, Andrea [47] see Matisoo-Smith, Lisa

Seetah, Krish (Stanford University), Saša Caval (Institute of Anthropological and Spatial Studies) and Diego Calaon (Department of Economics and Environment, Università Ca' Foscari)

[221] *Heritage, Identity and Pluralism: My Culture, Your Culture, Our Culture*

Issues of heritage and identity in a contemporary archaeo-anthropological context are underlined by a need to recognize and negotiate pluralism on the ground. While the theoretical development of 'heritage' takes place in one (academic) context, it is in a wholly different circumstance that practical outcomes are seen. Using Mauritius as a case study, a highly pluralistic island Republic incorporating different religions, languages, politically views and ethnicities, this presentation outlines the manner in which heritage has served to define identity. Furthermore, beyond the circularity of heritage serving to safeguard 'heritage', this case illustrates how aspects of culture -traditionally considered to be specific to an ethnic group - are transformed into common culture when viewed as heritage, rather than history.

Seikel, Katherine (Australian National University)

[244] *Architectural Analysis of Stone Monuments from Pohnpei*

Archaeological study of monumental architectural sites often begins with typological classifications with elaboration of sub-type definitions due to structural variations. Such classifications also recognize functional differences. To address such variability in form and function, quantifying architectural space by comparing structural footprints and volumes provides a way to estimate labor investment, and in turn relative ritual and political significance of sites. This paper discusses these issues, including problematic assumptions related to labor investment calculations, by focusing on mortuary and socio-politically significant stone architectural sites on Pohnpei, Micronesia. The sites incorporated in this study include Nan Madol, which is the largest monumental site in the Pacific.

[244] *Chair*

Seki, Yuji

[164] *The Archaeological Heritage Management and the Participation of the Local Community in the North Highlands of Peru*

In a modern world we archaeologists face many issues or problems related with local communities during our investigations. The Japanese archaeological team has had three interesting cases related to this theme in the Peruvian Highlands over the last 15 years. One is at Huacaloma, an archaeological site with ceremonial architecture. Local people have opposed the delimitation area of the site designated by the Peruvian government and the problem has not been resolved. The second case is Kuntur Wasi site where we collaborated with the local community and completed the construction of a site museum after the discovering gold offerings associated with several tombs. Now the local people of Kuntur Wasi voluntarily administer the museum. The last case is Pacopampa where an archaeological project is now going on. Although we can't show any concrete results like Kuntur Wasi, we are trying to find a new way of collaboration with the local community. In considering these three cases, I would like to emphasize the role of the archaeologist as an intermediary between the local community and the central

government in promoting cultural policy. Finally I will discuss the relationship between the management of the archaeological heritage and the tourism movement.

Sellet, Frederic (University of Kansas)

[28]

My Flute Is Bigger than Yours: Nature and Causes of Technological Changes on the American Great Plains at the End of the Pleistocene

Clovis and Folsom traditions are often spoken of in the same breath and contrasted to later Paleoindian complexes such as Agate Basin, Hell Gap and Cody. Yet a focus on typological similarities is misguided. Throughout the formative years of Paleoindian archaeology all fluted points were labeled Folsom or Folsomoid because basally grooved points had been first identified at the Folsom type-site. The implied phyletic connection between the two fluted point complexes is mostly a residue of historical inertia. In this paper, we review the organization of both Clovis and Folsom lithic technological systems, and identify fundamental and meaningful differences between the two. We argue that contrasts in technology and organization between Clovis and Folsom correspond with environmental changes during the Pleistocene-Holocene transition, and investigate the possible impact of climate change and resource distribution on early Paleoindian technology.

[28] *Chair*

Semon, Anna (University of North Carolina)

[6] *Examining Late Mississippian Paddle Designs from the Georgia Coast*

The unique paddle decoration found on complicated stamped pottery provides archaeologists with a means of determining the output of a particular potter, as well as patterns of interaction among groups. Most of the complicated stamped studies in the southeastern US focus on the Woodland period Swift Creek paddle designs and theories of exchange and social mobility, while the Late Mississippian paddle designs have received less attention. This poster presents the results of a Late Mississippian complicated stamped paddle design pilot study from a village site on St. Catherines Island, GA. In this study I examined sherds from several shell midden contexts for unique design elements and evidence of paddle flaws in order to determine paddle design variability at the site. Preliminary results are encouraging and indicate the use of several different paddles, which suggests multiple potters at the site.

Seo, Min [22] see Kim, Myeung Ju

Seong, JeongYong (Chungbuk National University)

[289] *Baekje's Formation of an Ancient State Observed through Pottery Style*

There have been several views proposed as to how such pottery bears a relation to the genesis of an ancient country in Korea. First, considering that forming pottery culture of a specific style in the central region is the creation of an ancient country, the spread of the central-style pottery culture to the provinces agrees to the territorial expansion of an ancient country. Another view is that the assimilation of the center into the provinces in the style of pottery does not directly agree to the penetration of national control. In that regard, I analyzed material culture of pottery and ironware excavated from Baekje territory, which revealed a possibility that some influence of central Baekje had already reached the provinces before pottery in the style of central Baekje appeared there. This led to the conclusion that the provincial spread of the central-style pottery in the territory of Baekje reflects an economic union between the center and provinces, not just a level of simple territorial expansion. This is a new proposal of the problem on an archeological meaning of pottery culture in the stage of ancient countries.

Sereno-Uribe, Juan and Israel Roman Ramos (Instituto Nacional de Antropología e Historia, Guerrero)
[234] *Current Settlement Survey along the Coast of Guerrero, Mexico*

This poster will present the results from the 2010, 2011, and 2012 field seasons of the Archaeological Atlas of the Coast of Guerrero Project and the Piedra Labrada Project reports, from the southeastern coast of Guerrero, Mexico. The study area extends from the Acapulco Bay until the boundaries of Oaxaca. In fact, this was a rather unexplored territory with no formal archaeological investigations for over 80 years. Subsequently, it was considered as an area of peripheral interest in comparison with more studied neighboring areas where a clear long-term development has been identified in Mesoamerica, such as the Valley of Oaxaca or the Basin of Mexico. Recent investigations have shown a variety of Prehispanic sites with architectural features and petroglyph compounds throughout the area, suggesting that it was a high populated area in Prehispanic times. The poster will give an introduction to the most representative archaeological sites by discussing basic information such as location, size, site chronology and/or other remarkable traits that were identified during settlement survey labors. A regional map of the study area, several plans of the urban cores and photographs of the sites will illustrate the poster in order to achieve a broad perspective.

Sergheraert, Maelle (ASU)

[229] *Calixtlahuaca's Embedded Carved Stones: Symbols of Religion, Power and Markers of Cultural Changes*

Four construction stages can be observed in Calixtlahuaca's monumental structures. This paper will focus on the carved stones embedded in the walls of the monuments and will examine their iconographic style. I will show that a specific style of carved stone is associated with each construction stage and I will address the question of their significance.

For this purpose, I will first rely on iconographic studies to help understand the symbolic meaning of these stones: were they markers of a deity, of a political power, did they convey specific calendar information?

Then I will work from a regional perspective to see if these carved stones were a local phenomenon or if they spread all over the Matlazinca region and even beyond. According to these final observations, I will be able to raise questions about regional exchanges and sphere of influence.

Sergio Sereni Murrieta, Rui [50] see Caromano, Caroline

Sérgio Sereni Murrieta, Rui [103] see Cascon, Leandro

Serio, Jillian and Sudarsana Mohanty

[108] *An Analysis of Burials Found in Yschma Domestic Spaces at the Site of Panquilma in the Lurin Valley, Peru*

The Ychsma site at Panquilma yielded two burials. The mummified remains of two individuals were discovered in the same unit; however, they were separate and exhumed from different layers. These burials were not found within the mortuary area of the site, such as a cemetery or mausoleum, but rather in the domestic sector of Panquilma. Ancestral veneration could explain this blurring of boundaries within the organization of Ychsma society; however the contextual information associated with the find is not consistent with typical methods of ancestor worship. The evidence lends itself to a different explanation worth investigating. The known burial practices of the Ychsma describe notable changes in their mortuary behaviors upon the Inka conquest, but offer little explanation specifying what kind of changes were adopted. Through this paper we present the archaeological context and associated artifacts found within this unit with the intent of describing the ancient rituals which lead to the final resting place

of these individuals within the domestic sector and in an attempt to relate this mortuary alteration to the effects of the Inka conquest, e.g. the shift in economic, political and religious power and control in the region.

Serio, Jillian [108] see Mohanty, Sudarsana

Serra Puche, Mari Carmen (IIA-UNAM)

[231] *Un Taller cerámico formativo en Xochitecatl-Cacaxtla*

En los últimos años hemos llevado a cabo excavaciones en varias terrazas habitacionales de Xochitecatl-Cacaxtla con el fin de detectar los elementos de la vida cotidiana de sus habitantes.

En las temporadas 2010 y 2012, excavamos una terraza con ocupación del periodo Formativo (900-500 a.c) localizando los pisos de unidades habitacionales en el tepetate y aproximadamente 40 formaciones circulares excavadas en el piso de tepetate, donde se depositaron gran cantidad de piezas cerámicas como cajetes, platos, ollas entre otros, la mayoría de ellos de los tipos blancos y también incensarios zoomorfos que representan tlacuaches. Se localizaron seis hornos e instrumentos que indican la manufactura de las piezas cerámicas in situ. Se trata entonces de analizar el papel que juega dentro del contexto doméstico la especialización y si estamos ante un espacio de uso exclusivo para manufactura, almacenamiento y distribución de cerámica.

Setzer, Teddi J. [158] see Ramadan, Tareq

Setzer, Teddi and Susan Ward (Wayne State University Department of Anthropology)

[158] *Damaged Histories and the Bioarchaeology of a Late Nineteenth Century Family Mausoleum at Oak Hill Cemetery, Pontiac, MI*

During a restoration project, desecrated human remains and associated funerary artifacts were recovered from a late 19th century mausoleum at the Oak Hill Cemetery in Pontiac, Michigan. The mausoleum housed the interments of the Southard family, who were pioneers to the City of Pontiac and elite members of their community. During this project, a review of historical data allowed us to contextualize the human and material remains. By examining the lives of these individuals and incorporating evidence from the material and skeletal remains, we are able to personify the past and provide the life histories of the Southards. Adequate data were available to make political, ideological, social, and economic interpretations about these individuals, as well as the history of Pontiac. In addition, the role of the past in the formation of a communal identity and its preservation within the present-day political and economic climate of Pontiac is addressed.

Seymour, Deni [75] see Hill, David

Seymour, Deni

[175] *Plaint Communities: Seasonal Mobile Group Visitation at the Eastern Frontier Pueblos*

This paper explores the notion of community formation, interaction, and transformation within the broader context of the regional social landscape. It departs from the more usual community studies that focus on internal mechanisms of community formation and cohesion, and instead examines the seasonal transformation of the community and temporary expansion of social boundaries through the addition of mobile populations at settled villages. In such a scenario the core of the populace at a locality remains stationary and constant, but community boundaries and composition vary seasonally and

geographically, sometimes expanding exponentially. Parallels to modern winter visitors to border regions are explored.

Sgarlata, Cosimo (Western Connecticut State University)

[264] *Predictive Model for Danbury, Connecticut*

In February 2012 I was hired as a consultant for the Danbury Historical Commission to create a predictive model for prehistoric sites in Danbury, Connecticut. This paper describes the creation of the model using logistical regression analysis, as well as the potential for predictive modeling to assist in the protection of important archaeological resources.

Shackley, Steven (UC, Berkeley)

[62] *Discussant*

Shaham, Dana (Institute of Archaeology, The Hebrew University) and Anna Belfer-Cohen (Institute of Archaeology, The Hebrew University)

[248] *The Natufian Audio-Visual Bone Pendants from Hayonim Cave*

The Natufian archaeological entity in the Levant (15,000 – 11,500 cal B.P.) shows evidence of unique behavioral and cultural phenomena, reflected in its material remains (e.g. durable structures, the abundance of graves, and continuous production of art manifestations). Altogether these various lines of evidence were recognized as valid indication of growing social complexity. Decorated burials are a specific practice which has been identified in several Natufian sites. At Hayonim Cave some of the Natufian skeletal remains had been richly adorned with jewelry; some of the necklaces-cum-bands were objects that could be rattled. Consequently they represent an audio-visual objects or idiophonic jewelry ("dance adornment"). Morphological and contextual examinations indicate a specific type of bone pendants 'chains' that will produce the highest level of rattling sound. Investigations of these pendants according the comparative approach of art research along with musicological-organological considerations shed an interesting light on these objects. We can define an articulated visual-artistic and acoustic-musicological feature, which is also articulated with a specific cultural behavior that stands behind the production of these pendants. Further discussion of these results following an aesthetic approach and socio-biological models may illuminate a particular cultural mechanism in the formation of complex societies.

Shantry, Kate (SWCA Environmental Consultants)

[88] *Using Empirical Archaeological Data to Indirectly Construct a Growth Curve from Crustose Lichen Species in North-Central Washington*

Lichenometry is a dating technique that has been neglected in archaeological research despite its potential utility. Features from the geographic interface of the Columbia Plateau and North Cascades offer an opportunity to construct an indirect growth curve specific to this micro-region. This study compares measurements of lichen species on historical, dated features, in the vicinity of the Okanogan-Wenatchee National Forest.

Shapiro, Beth [172] see Kistler, Logan

Sharp, Emily (Arizona State University) and Rebecca Bria (Vanderbilt University)

[57] *Defining Recuay Lifestyles and Mortuary Practices through the Bioarchaeological Study of Recuay Tombs in the North-Central Peruvian Highlands*

The dissolution of Chavín at the end of the Formative Period ushered in an era of sweeping changes in the north-central Andes that included changes in settlement patterns, proliferation of ethnic

groups, increased concern with defense, and new mortuary practices. As various ethnic groups emerged, so did new behaviors associated with group membership and group identity. Warfare and violent conflicts were several practices that likely intensified in response to novel social and political developments, but these changes have not been documented skeletally for this time period. Excavations at the site of Hualcayán have uncovered several Early Intermediate Period (200 B.C.-A.D. 600) Recuay tombs that were built into Late Formative (900-200 B.C.) era ceremonial contexts. Bioarchaeological analyses of these secondary burials allows for the reconstruction of age and gender identities, health status and workload, and accidental or violent injuries. Additional materials recovered around the tombs provide compelling support for feasts carried out by the living to venerate the dead. As this study demonstrates, an approach rooted in osteological analyses of human remains and their mortuary context contributes valuable information regarding the identities, life histories, and mortuary rituals of individuals living in the Recuay region.

Sharratt, Nicola (American Museum of Natural History/Bard Graduate Center) and Gabriela de los Rios Farfan

[239] *Representing and Misrepresenting Social Order: Ritual Space and the Collapse of the Tiwanaku State*

During the Middle Horizon (A.D. 500-1000), the Tiwanaku state held political, economic and religious sway over the south central Andes. The collapse of the state, circa A.D. 1000, was accompanied by the abandonment of cities, rejection of state affiliated iconography and the violent destruction of buildings. In both the state heartland and in the distant colonies, temples and other built ritual spaces were targeted for particularly vehement assault. In this paper we examine the role that religious structures and activities may have played in the construction, expression and legitimization of inequality during the height of state authority. Discussing archaeological data from the site of Tumilaca la Chimba, a village established in the wake of state breakdown in the Moquegua Valley, Peru we then examine how ritual practice was re-situated and utilized in the negotiation and representation of post-collapse social organization and hierarchies. Focusing on recent excavations in a collective ritual area at the site, as well as cemetery and household data, we suggest that the apparent equality and accessibility evident in 'ritual' spaces belied the inequality apparent in domestic contexts.

Shattuck, Rebecca E. [286] see Yim, Robin

Shaw, Justine (College of the Redwoods)

[290] *The Problem of Mobility in Estimating the Extent of Terminal Classic Populations in the Cochuah Region*

Since the inception of the current program of research in 2000, it has been evident that visible surface remains dating to the Terminal Classic are extremely prevalent; with 84 sites recorded, all those with a Prehispanic presence evidence a Terminal Classic occupation. Although it seems that there must have been a significant population increase to account for such a marked upswing in architecture and ceramics, at least a portion of the "growth" may instead be accounted for by a change in settlement strategy. Until the advent of public services within a limited number of towns in the region, families regularly moved between at least two homesteads in order to compromise between the need to be nearer to their fields during portions of the year and the desire to be closer to other individuals for social, economic, religious, and political reasons during the remainder of the year. Drought conditions would have exacerbated this pattern, likely producing seasonal patterns of dispersal and aggregation. Thus, while not negating the Terminal Classic as a period of fluorescence for the Cochuah region, it is necessary to consider how increase mobility may account for a meaningful portion of the "growth" during this time.

[290]

*Chair***Sheets, Payson (University of Colorado)**

[210] *What Was That Sacbe Doing at Cerén?*
 A serendipitous discovery at Cerén last summer was a two-meter wide sacbe. Constructed of highly compacted white tephra from the Ilopango eruption, with no stone linings, it featured formal canals on both sides, and cornfields on each side beyond the canals. It was frequently refurbished with the whitest component of that tephra, perhaps in an effort to meet the Maya ideal (in Yucatec "sacbe" translates as "white way"). Among its possible functions: (1) economic, as it passes through maize-beans-squash fields and next to the manioc fields, and toward the marketplace at San Andres; (2) perhaps religious, because if it keeps curving it may end at the two religious buildings in the village; (3) social, connecting communities in the valley; (4) potentially political, as some higher authority beyond Cerén may have had some power over manioc production and construction-use-maintenance of the sacbe. The sacbe would not have preserved for long without maintenance, as it lacked the stone construction of almost all sacbeob in the Yucatan. Limestone is easily quarried and shaped. Earthen-only sacbeob might have been common in the volcanic highlands, where easily quarried and shaped stones are rare, but they would disappear shortly after they were abandoned.

[131] *Discussant*

Shelton, Christopher

[147] *Parameters for Lithic Raw Material Choice: Modeling the Middle Stone Age on the Southern Coast of South Africa*

The Middle Stone Age (MSA) record in Southern Africa is a period of increasing variability in stone tool technology and lithic raw material selection. Lithic industries fluctuate between low and high quality raw materials, and concomitant shifts between larger flaked tools and small, technologically complex microliths and bifaces. In order to better understand these shifts, this poster ranks the raw stone outcrops according to their respective flaking characteristics within the gathering range of Pinnacle Point, a coastal MSA site in South Africa. These flaking characteristics, which are generally qualitative, are quantified for numerical rankings using mechanical fracture tests that have been previously proven to be excellent proxy indicators. Quartzite and silcrete (the latter in both raw and heat-treated form), the two most prevalent and prominent lithologies in the Pinnacle Point assemblage, are the foci of the experiment. By ranking these raw material sources and comparing the results to such factors as distance to site and energy required for heat-treatment, we can create cost/benefit choice models which may allow us to better understand the choice patterns and technological shifts of the MSA.

Shen, Chen (Royal Ontario Museum)

[31] *Discussant*

Shennan, Stephen [291] see Edinborough, Kevan

Shepard, Ben (UCLA)

[77] *Contrasting Approaches to Burials and Demography in the Study of Middle Holocene Hunter-Gatherers in Cis-Baikal, Russia*

Burials constitute an important type of data for reconstructions of prehistoric social organization in hunter-gatherer societies and more broadly. Here I contrast two sets of starting assumptions about the use of burial data for reconstructions of Middle Holocene social organization among hunter-gatherers in Cis-Baikal, Russia. I suggest that contemporary studies should carefully contextualize burials in terms of changing political or economic opportunities that

ritual burial could have offered its participants. I also suggest that current research has used burial data in Cis-Baikal largely to understand what Weber, Link, and Katzenberg (2002:288) call "hunter-gatherer adaptations as a whole." I discuss some of the significant impacts of this "holistic" project on reconstructions of ancient social organization, suggesting that while this perspective has been enormously productive in furnishing a set of starting assumptions for the study of cultural adaptations during the Middle Holocene, it also tends to categorically emphasize group-level adaptations and downplays the social impact of individual actors and intra-group competition.

Sheppard, Peter (University of Auckland) and Andrew McAlister (University of Auckland)

[62] *Correction for Matrix Effects in pXRF*

The use of portable X-Ray Fluorescence (pXRF) analyzers has become increasingly common in archaeological science. These instruments offer many advantages over traditional geochemical methods, such as low cost, portability, non-destructive analysis and almost instant results. However there are also limitations that must be understood in order to obtain optimum results. One criticism has been that quantitative data are not always compatible with those from other techniques. We examine some of the reasons why this might be the case. Almost all pXRF analyzers include at least two settings, usually one intended for metals and one for soils. For the analysis of non-metallic archaeological materials, the soil setting is typically used because it provides data for the most useful elements. This setting gives reasonably accurate results for the mid-Z elements (i.e., Rb to Nb) over a wide range of materials. Analyses of the lighter elements (K to Zn), however, are often accompanied by errors that render data virtually unusable. We demonstrate that these errors are largely related to differences in the matrices of various materials and discuss some matrix-correction techniques that can be applied to pXRF. Our study focuses on Oceanic basalts and obsidians but is applicable to many other materials.

Sheridan, Thomas (University of Arizona)

[67] *Coronado and the Moquis: Hopi Oral Traditions and the Tyranny of the Written Record in 20th Century Southwestern Anthropology*

Moquis and Kastiilam: The Hopi History Project compares and contrasts Spanish documents about the "Moqui" and Hopi oral traditions about the "Kastiilam." Nowhere is the contrast more stark than in accounts of the first encounters between Spaniards and Hopis in 1540. Castañeda, chronicler of the Coronado expedition, describes an initial skirmish followed by peaceful trading. Hopis and Zunis told later Spanish explorers in the 16th century that Coronado's soldiers destroyed a Hopi community---a story they continue to tell more than four centuries later. Twentieth century anthropologists dismissed these traditions, privileging the written record despite its biases and silences. The Hopi History Project argues that the remarkable persistence and coherence of Hopi oral traditions demand greater attention and respect from 21st century scholars.

Sherman, Jason [178] see Minc, Leah

Shibata, Koichiro (Kobe City University of Foreign Studies)

[236] *Food for Visitors? Feasting and Canis Consumption at Cerro Blanco de Nepeña*

Feasting in the prehispanic Central Andes has been regarded as required for the social integration, political reconciliation and economical consolidation, and thus meals served for feasts could have been carefully selected. During our two seasons of excavations at the Formative site of Cerro Blanco, located in the lower Nepeña valley, a sealed context of rich feasting refuse was uncovered. Besides the extraordinary quantity and quality of ceramic vessels and other local and exotic materials, a large

amount of dog bones was recognized. Comparative analyses in different scales suggest that the dog meat was not a part of local food variations of the lower Nepeña valley but it was served exclusively on the feasting activities at a few important centers as Cerro Blanco that had been a node of interregional interactions among specific regions.

Shibutani, Ayako (National Museum of Japanese History)

[250] *Needs and Passions of Plant Food Consumption: Starch Reveals Functions of Ground Stone Tools and Potteries in Prehistoric Japan*

This paper employed starch residue analysis on ground stone tools and potteries to recover plant food consumption in hunting-gathering populations at the Shimo-yakebe site (Middle to Final Jomon sub-period, ca. 5,300-2,800 cal B.P.) in the Kanto Plain, central Japan. Plant macrofossils, wooden structures for water usage, and mounds of Aesculus, Juglans, and Quercus fruits were found in and around lowland structures from this site. Numerous stone tools including querns and grinding stones and forty charred plant remains inside Jomon pottery were also excavated. This study examined thirty-eight charred plant remains adhering to pottery sherds and twenty stone tools to explore these utilization purposes. Starch residues were well preserved with features that resemble those seen in fresh specimens. Starch granules formed in amorphous plant tissues were found from residues on sampled materials. This can be the empirical evidence for containing tubers and bulbs into those residues. Starch remains can show that the population of the Shimo-yakebe site collected and processed various plants, particularly nuts (Aesculus, Castanea, Juglans), acorns (Quercus, Lithocarpus, or others), and bulb or tuber plants (Allium, Pteridium, or others), and that the processing methods of wild plants using ground stones and potteries in the Middle to Final Jomon periods.

Shimada, Izumi (Southern Illinois University)

[64] *Lessons Learned from Working with Local Apache Youth*

Like so many other archaeological projects throughout the world, Grasshopper field school operated on someone else's domain. In 1972, through the request of the White Mountain Apache Indian tribal council, local youth (up to 25 of them) of the nearby Apache community of Cibecue were employed as a part of the field school. This paper discusses my basic philosophy and approach adopted to integrate them and the valuable lessons I learned from working with them as their foreman (1972-3) and how these were invaluable in my long-term relationships with local workers and communities in Peru.

Shimada, Izumi [183] see Wagner, Ursel

Shimoda, Yasushi, Hajime Ishida (Department of Human and Anatomy, Faculty of Medici), Minoru Yoneda (Department of Integrated Biosciences, Graduate Sch), Yuichi Naito (Department of Integrated Biosciences, Graduate Sc) and Tomohito Nagaoka (Department of Anatomy, St. Marianna University Sch)

[194] *Reconstruction of Life Activity and Subsistence in People of the Prehistoric Okhotsk Culture, Northern Japan*

Degenerative changes in people of the Okhotsk culture were investigated in adult human skeletons to reconstruct their lifestyle. Findings were compared with those in materials from the medieval Kamakura period and early-modern peasants on Ryukyu Islands, Japan. Severe osteophytes on the body of the lumbar vertebrae were more frequently seen in the Okhotsk males. Degenerative changes of the articular process of the Okhotsk were most frequently seen in the lumbar vertebrae. This is well contrasted with a high frequency of degenerative changes of cervical apophyseal joints in Ryukyu peasants. High prevalence of elbow and knee joint changes in the Okhotsk showed a strong contrast

with the high frequencies of hip joint changes in materials from the Kamakura and those in the shoulder and hip joints in materials from Ryukyu. Because the Okhotsk culture developed a considerable maritime infrastructure, the lifestyle required for sea-mammal hunting and fishing seems to have particularly affected the incidence of severe degenerative changes of the lumbar vertebrae, elbow and knee. Isotopic signatures in bulk collagen and some amino acids show significant differences in the subsistence of each group. Reconstructed diet is considered for correction of radiocarbon marine reservoir effects on those human remains as well.

Shin, Dong Hoon [22] see Kim, Myeung Ju

Shin, SookChung (Hangang Institute of Cultural Heritage), Habeom Kim (University of Oregon) and Song Nai Rhee

[289] *Preliminary Thinking about Trade Relationships between the Korean Peninsula and Neighboring Areas during the Neolithic Age*

The Korean Peninsula is surrounded by China, Russian Primorye and Japan. Such a geographical location provides opportunities for various exchange routes and a trade network to Korea. Three types of evidence are found in regards to interchange during the Neolithic period in Korea: 1. The resemblance of the types or patterns of artifacts: Typical neolithic pottery incised with zigzag patterns in northeastern China is also found on the Korean Peninsula and its southern coast. Jomon pottery along with obsidian tools have also been found in shell middens on the southern coast of Korea. 2. Analyses of raw materials for the place of origin: Obsidian raw materials imported from Baekdusan Mountain have been identified at the Osan-ri site, suggesting a trade network between the two regions. Obsidian tools excavated from the shell midden on the southern coast of Korea were quarried from Kyushu, Japan. In contrast, bracelets made from Glycymeris abaloneata that originated from the southern coast of Korea were exported to Japan. 3. Certain artifacts – slotted jade earrings, typical grave goods – were distributed across northeast Asia. The regional distribution of these items encompasses an extensive area from northeastern China to the maritime Province of Siberia.

Shinde, Vasant (Deccan College Post-Graduate and Research University)

[245] *Discussant*

Shinoda, Ken-ichi [194] see Adachi, Noboru

Shirar, Scott (University of Alaska Museum of the North), Loukas Barton (University of Pittsburgh), Jeff Rasic (National Park Service Fairbanks Administrative Cen) and James Jordan (Antioch University)

[130] *2000 Years of Fishing Technology from the Central Alaska Peninsula*

The prevailing hypothesis regarding change in net fishing technology on the central Alaska Peninsula during the last two millennia centers on a pattern that older sites have larger, heavier net sinkers and later sites have smaller, lighter net sinkers. Recent field research conducted on the Alaska Peninsula, in an area between the Aniakchak and Veniaminof volcanoes, adds 60 new sites to the record, most of which are villages that date within the last 2000 years. Small-scale testing at eight of these sites produced a sample of 100 net sinkers from a total of 17 dated house features. This paper presents the characterization and analysis of these net sinkers and preliminary results indicate the observed size pattern holds true for this assemblage. Reasons for this temporal variation in size are not well understood but certainly indicate a change in net fishing over time, which may be a result of alterations in net form, fishing technique, or salmon abundance.

Shiratori, Yuko (CUNY)

[140] *Community Patterns of the Late Postclassic Itza Maya at Tayasal, Guatemala*

Examining material patterns within a settlement or region may lead to a better understanding of group identity and community organization. Configurations of architecture and artifacts can help inform archaeologists about intercommunity organization as well as social status and the structuring of specific activities. Supplemented by ethnohistorical studies of Contact (AD 1525-1697) and Colonial (AD 1697-1821) period Itza Maya communities in Petén, Guatemala, recent archaeological investigations at the site of Tayasal provide insight into Postclassic Maya social organization. Excavations at Tayasal demonstrate that ceremonial and domestic groups constituted a pattern of "community" of the Late Postclassic period Petén Lakes region. In this paper, we will discuss recent archaeological data recovered from Tayasal and offer some preliminary interpretations of those data, particularly those that contribute to the identification of community and the understanding of the community organization. The site had multiple ceremonial areas, each with associated residences indicating a number of distinct communities, which shared certain elements of organization.

[140] *Chair*

Shiroma, Calvin (JPAC CIL) and Bradley Jones (JPAC CIL)

[251] *A Comparison of US and Republic of Korea Dental Care Recovered from Korean War Remains*

Attendees will have the opportunity to view examples of dental care (restorative and endodontic) from the remains of US and Republic of Korea (ROK) servicemembers. Upon the completion of this presentation, the audience will appreciate the differences in care, thus gaining an additional piece of evidence which may assist the recovery leader/archaeologist in segregating US from ROK military personnel.

At this time, an estimated 130,000 ROK and 8,000 US servicemembers are still listed as missing in action from the Korean War. The discovery of ROK personnel with restorative/dental care is significant since the South Korean Dental literature is void of any dental materials reference textbooks. Thus, the documentation of South Korean restorative care from this era is a major find, provides for the initial foundation, and a reference source for all upcoming recovery missions. Conversely, care performed and materials used by US dentists during the Korean War era may be authenticated by dental materials and clinical textbooks/references of that time period. This basic means of comparison will assist the recovery leader/archaeologist in the repatriation of remains from US servicemembers and not those of a Foreign National.

Shoocongdej, Rasmi [7] see Van Vlack, Hannah

Shott, Michael (University of Akron)

[28] *Discussant*

Shuttleworth, Andy (University of Liverpool)

[215] *The Silver Age: Neanderthal Foraging and Social Behaviors in MIS-3*

The behavioral capacities of Neanderthal foragers throughout the Middle Palaeolithic have been the focus of intense debate for the past 40 years. Though new archaeological and genetic data has increased our understanding of Neanderthal resource acquisition, migration and phylogeny the nature of these records have left us with little understanding of Neanderthal social behavioral expressions and their role within Neanderthal society. This paper presents the culmination of four years of research which has utilized both ethnographic analogy and statistical behavioral

modeling to determine how the environment of Europe during MIS-3 would have influenced the Neanderthal expression of a range of social behaviors. Results suggest that Neanderthal behavior was influenced by the acquisition of food resources and that both Neanderthal and AMHs adopted similar behavioral frameworks throughout the MP/UP transition; which suggests both species displayed a behavioral and cognitive parity throughout the transition and that other factors (notably physiology and demography) may have limited the Neanderthal ability to create symbolic artifacts.

Siebe, Claus (Instituto de Geofisica, UNAM)

[131] *Late Pleistocene/Holocene Plinian Eruptions of Popocatépetl Volcano (Central Mexico) and Their Catastrophic Impact on the Environment and Human Populations*

Volcanological studies over the past 20 years at Popocatépetl volcano have yielded a wealth of data including hundreds of radiocarbon dates that allow us to constrain the frequency and magnitude of eruptions that have affected this area during the course of the past 25,000 years. This new information has important implications for archaeology and future hazard evaluations.

Although most eruptions at Popocatépetl are small, stratigraphic studies have revealed recurrent cataclysmic Plinian eruptions of considerable magnitude. They have affected vast areas, including zones that today are occupied by large population centers (e.g. Puebla, Mexico City, Cholula, Cuautla, etc.).

Two Late Pleistocene (ca. 22,000 and 14,100 yr. B.P.) and three Holocene (ca. 5,000, 2,150 and 1,100 yr. B.P.) Plinian eruptions were studied in detail. Eruptive columns reached >40 km in height and up to 9 km³ of pumice and ash were deposited each time. After each eruption, extensive flooding by lahars laid waste to the plains surrounding the volcano and it took decades before the landscape would become stable again and allow vegetation to recover. Because these eruptions had such a severe impact on the environment they must have also influenced the course of the civilizations that developed in this region.

Siegel, Peter, Renzo S. Duin (Leiden University) and Jimmy L.J.A. Mans

[292] *Down-the-Line Encounters: Processes of Exchange, Post-Colonial Experiences, and Globalization in the Island of Guiana on the South American Continent*

In the contexts of maintaining distinct identities and of active processes of ethnogenesis, well-established webs of relations and exchange exist across Guiana. Located within the mainland of northern South America, Guiana is an island demarcated by the Atlantic Ocean and the massive river systems of the Orinoco and Amazon. Numerous Amerindian groups with purportedly distinct identities have been documented in the region by social anthropologists, archaeologists, and ethnohistorians. Relations of production and distribution, long identified ethnohistorically and ethnographically, are now mediated and (re-)negotiated in the twenty-first century globalized world. In this paper, we address post-colonial experiences of three interacting Amazonian peoples: Trio, Wayana, and Waiwai. Pawana are trading partners or friends and through their networks things and ideas move between the three groups. Three key questions guide our investigation: Are legacies of colonial encounters resulting in forms of ethnogenesis that might better be called ethnocidal? Are village communities composed of people from different ethnic groups an artifact of globalization or part of a shifting indigenous design that over the long term is expressed as a cultural kaleidoscope? By analytically distinguishing groups within Guiana and separating them from larger global processes do we create essentialist caricatures of Amerindian identities?

Sikes, Chacha [105] see Toffalori, Elena

Silliman, Stephen (University of Massachusetts Boston)**[52]** *Discussant***Silva, Fabio (UCL Archaeology) and James Steele (UCL Archaeology)****[215]** *New Numerical Approaches to Modeling Hunter-Gatherer Geographical Range Dynamics*

This paper will discuss the potential of a modified version of the Fast Marching algorithm for the modeling of hunter-gatherer range expansions. This algorithm, developed by the authors (Silva and Steele 2012) can be used to simulate several range expansions on a realistic bio-geographical domain. Biological, geographical and climatic information is parameterized as a "friction" term that affects the front speed locally. In this way constraints to diffusion, like mountains or open sea, and corridors that boost the dispersal process, for instance rivers, can be added to the simulations, considerably improving the models' results. It also permits the results of different theoretical models to be compared and contrasted, both qualitatively and quantitatively, to the empirical record.

Boundaries between different dispersal processes, under the first arrival rule, can also be predicted, a methodology that has already been applied to the analysis of the dispersion of pottery in the Old World.

This paper will introduce the algorithm, discuss its potential for modeling Pleistocene range dynamics and present preliminary results on modeling the colonization of Australia.

Silverstein, Jay (JPAC/University of Hawaii)**[176]** *This Land Is My Land: Identity and Conflict on the Western Frontier of the Aztec Empire*

Embedded within the institution of imperialism are asymmetric and hierarchical socio-political relationships. Such relationships are often formed in punctuated episodes of conquest and annexation followed by decades or centuries of readjustment and socio-economic evolution. In spite of the profound inequities in status, political power, and wealth, conquered peoples tend to show resilience in their ability to preserve cultural identity and persistence in taking opportunity to reassert territorial independence. The Late Postclassic conquest of the Chontal people of Oztuma by the Aztec Empire is no exception to this pattern.

Archaeological and ethnohistoric data illustrates that the boundary between the Aztec and Tarascan Empires was shaped not only by imperial design and strategic necessity, but by a complex frontier dynamic in which conquered peoples were neither passive nor subdued. When opportunity appeared in the form of the destruction of the Aztec central government, the local peoples reasserted their rights by contesting the legitimacy of rule of the Nahuatl speaking colonists who had subjugated their homeland.

Silverstein, Jay [176] see Littman, Robert

Simanjuntak, Truman [219] see Buckley, Hallie

Simmerman, James [286] see Moore-Jansen, Peer

Simmons, Alan (University of Nevada Las Vegas, Department of Anthropology)**[3]** *No Village Is an Island: Cyprus as a Cross-Roads for Early Mediterranean Sea Voyagers*

Over the past several years, much of Mediterranean prehistory has been rewritten by research on Cyprus. The previous image of a limited or non-existent human presence on the island until the

late Neolithic, around 7,000 cal. B.C., is no longer valid. We now know that Cyprus was used by humans at least 12,000 years ago, although the extent of this pre-Neolithic usage is still controversial, and new findings on Cyprus and other Mediterranean islands have added fuel to the debate over the extent of early sea-faring.

Equally significant are surprising new Neolithic finds that place the island's first villagers as contemporary with early mainland settlements. This paper examines the scope of variation of the early Neolithic in both coastal and upland contexts. Most sites represented are villages engaged in an unexpectedly complex and wide range of activities. This included feasting, some of the earliest use of domesticates in the Near East, and consistent interaction with the mainland. Some of the potential reasons for this early colonization of a remote island, and the specific adaptive challenges posed by a restricted environment, are discussed and I conclude with a comparison to the mainland, where a different Neolithic transformation with different outcomes occurred.

Simmons, Alan [3] see DiBenedetto, Katelyn

Simmons Johnson, Wendy**[128]** *An Underground Store, The Skull Valley Goshute, and Red Ink*

From the late 1860s to 1914, there was an strange and interesting underground store in Rush Valley (Tooele County, Utah), owned and operated by the William Ajax family. Settlers and local Native Americans for miles around would come to the store to browse through the surprisingly large quantity of merchandise, and purchase manufactured goods, or agricultural products. Just west of the location where the Ajax Store was situated is a protohistoric site. The artifacts and site surface patterning combined with historic research in the area seem to indicate that the site was occupied for short periods by Skull Valley Goshute for trade with the Ajax Store. Histories of the area indicate that Goshutes from Skull Valley would come to the Ajax Store to trade pine nuts and gleaned wool for manufactured goods, as well as beg for food items. The Ajax Store site and protohistoric site, combined with local histories, appear to try and tell a story of the early Mormon settler relations with the local Skull Valley Goshute Tribe.

Simms, Stephanie [65] see Parker, Evan

Simon, Katie [129] see Simpson, Bethany

Simonson, Mindy [251] see Tallman, Sean

Simova, Borislava**[178]** *Identity Formation in Late Preclassic to Early Classic Maya Domestic Contexts at the Site of Actuncan, Belize*

Within this study, ceramics from households at the site of Actuncan, Belize, are used to identify the stylistic markers of social affinity based on kinship, status, and polity. In the absence of clear identity emblems, more subtle variations in the physical appearance of ceramic vessels are explored as potential markers of social differentiation. Ritual contexts are of particular interest, since the selection of their material components from generally available items can serve to create a marked category of experience and reflect notions of group affinity. Kinship differentiation is gauged through comparisons between households, particularly in dedication and termination caching, while status is gauged through ceramics associated with human remains. Polity based affinity is addressed through a diachronic comparison between the Late Preclassic and Early Classic periods, which were marked by political and ideological shifts associated with the institutionalization of kingship at Actuncan. Understanding the basic units of identity construction and the contexts in which they are invoked can guide understanding of

complex social systems and dynamic processes.

Simpson, Bethany (UCLA), Anne Austin (UCLA) and Katie Simon (Center for Advanced Spatial Technologies, Universi)
[129] Analyzing Three Methods for Digital Preservation of Architectural Data at the Greco-Roman Site of Karanis

An important issue in archaeological fieldwork is how to address the conflicting need to thoroughly document and yet protect exposed architectural remains. Conventional methods of recording spatial data can be time-consuming and invasive for fragile sites. Documentation of three-dimensional data itself can even pose a danger to the conservation of the site and the data archaeologists are attempting to capture. To resolve these conflicting needs, our paper evaluates three methods for documenting architectural remains: photogrammetry, three-dimensional laser scanning, and total station mapping. Our research was conducted at the site of Karanis in Egypt's Fayum region, chosen primarily for its mudbrick architecture which annually faces conservation threats from Aeolian erosion, plundering, and occasional rainfall. We found the use of three-dimensional laser scanning to be extremely efficient and thorough, though fiscally impractical for most fieldwork. Photogrammetry, on the other hand, requires only minimal financial investment, but may be impractical for sites where optimum viewsheds are limited. Finally, traditional total station methods offer the most useful data points, but limited options for three-dimensional analysis. Based on these observations, we will offer suggestions for how to determine which method to use based on the budget, time, topography, and research objectives of a mission.

Sims, Marsha (Nat Resources Conserv Svc)

[103] Islands in the Mountains, Plant Utilization, and a Look at Frontrangia and Uncompahgria in Colorado - Relic and Sandy Soils, Access to Lithics, and Archaeological Sites

Researchers have documented the remains of gathered seeds, charred vegetation in hearths, and macro- and micro-remains of plants at various archaeological sites in Colorado, and this paper outlines analyses of edible plants. Mountainous areas such as the Front Range have been considered void of edible plants, and presented are plants that would support human life in this and other areas. One - Rubus spp. - could have provided the basis for the evolution of humans. Analyses also include the mountain islands of Frontrangia and Uncompahgria, wildflowers, quarries, exposed relic soils, and archaeological sites. This research focuses on sites providing evidence of plants and/or plant processing implements. Examples of legends, pictographs along the Front Range, sculptured bird forms above an overhang covering boulder metates/mortars, and other boulder metates/mortars that occur along the Front Range in an effort to analyze plant utilization. Evaluations include guiding forces such as birds and other fauna for human adaptations to the changing environment from the Pleistocene to the Holocene and on into the Archaic.

Sinensky, Robert (Northern Arizona University Graduate Student)

[130] Chew on This: Risk Management and Resource Procurement Strategies at the Early Agricultural Village of Las Capas

This paper explores the impact of changing environmental conditions on early farmers in the Tucson Basin during the San Pedro Phase (1200-800 B.C.) of the Early Agricultural Period. Previous research at Las Capas identified intense occupations in 2 stable strata dating between approximately 1200-1000 B.C. and 950-800 B.C. Archaeologists identified a period of instability due to heavy flooding at the site between the 2 intense occupations dating to approximately 950 B.C., and lasting less than 100 years.

Researchers uncovered few cultural features in the flood sands and hypothesized that the site was abandoned, or lightly used during this interval. Desert Archaeology's recent 2008-2009 excavations at Las Capas uncovered evidence of continued occupation during the period of environmental instability. Cultural features investigated include irrigation canals, pit structures and a variety of extramural features and activity areas. I use data from previously analyzed paleobotanical materials from multiple excavations at Las Capas. I compare this information to data I have collected from 50 paleobotanical samples from cultural features located in the period of environmental instability. I use the data to assess the risk management and resource procurement strategies of early farmers during conditions that were both favorable and detrimental to irrigation agriculture.

Singh, Parth (University of Michigan- Ann Arbor) and Jason De Leon (University of Michigan-Ann Arbor)
[121] ¿Cuanto Vale?: An Economic Analysis of Migrant Stations and the Corporations Who Profit from Undocumented Migration

Each year, thousands of undocumented migrants attempt to enter the U.S. by walking across the Sonora Desert of Southern Arizona. At border towns in Northern Mexico, specialized vendors often sell migrants food, clothing, and a variety of other items that are used during crossings. These items are later left behind at temporary camp sites known as 'migrant stations'. These migrant stations can range in size from a handful of water bottles to several thousand items. While many have commented on the detrimental impact that migrant artifacts have on the desert, no systematic attempt has been made to understand what these sites represent in terms of economic costs to border crossers. Moreover, little attention has been devoted to understanding the role that global corporations (e.g., Gatorade, Red Bull) play in both facilitating and profiting from migration. In this poster, I present an economic study that involved calculating how much money (both in cost to migrants and profits made by manufacturers) is represented in the archaeological record at multiple migrant stations. This analysis of migrant supplies provides new insight into the economic costs of migration, as well as the role that global corporations play in the political economy of undocumented migration.

Sinton, John [274] see Rolett, Barry

Sion, Julien [144] see Arnauld, Charlotte

Sitek, Matthew (UC San Diego) and Paul Goldstein (UC San Diego)

[238] Excavations in the Omo Temple Middle Court: Implications for Access and Ritualized Movement in Tiwanaku Temples

Ritualized movement through monumental architecture can represent physical manifestations of power relationships and perceptions of cosmological order. The Omo Tiwanaku Temple in the middle Moquegua Valley is the only known Tiwanaku-style monumental architecture found outside the civilization's highland heartland. This structure, known as the Omo Temple, is a three-tiered platform structure built into a hillside overlooking the habitation and cemetery sites. Ritualized passage and movement, in the form of procession and restriction of access, appear to have been significant aspects of the middle court's construction and use. This paper will discuss how the middle court controlled the access patterns of the Omo Temple. Recent excavations on the central tier of the structure, known as the Middle Court, have revealed entry to the court was through a complex of three gateway platforms connecting to a central patio and two chambers. I will discuss the implications of this pattern for social divisions within the colony as indicated by a general increase in restriction of movement as one proceeded up the tiers of the structure.

Skinner, Mark [38] see Zhang, Hua

Skinner, Alan and Catrina Whitley

[276] *Drought and Burial Exposure in North Texas*
 Due to the numerous man-made lakes in North Texas, exposure of unknown sites, cemeteries, and graves will continue to be an issue during drought cycles. Both historic and prehistoric sites are being eroded by lake edge wave action and churning. Reporting and monitoring lake shores is dependent upon local fisherman or artifact collectors who regularly walk the beaches and streams. This leaves skeletal remains subject to looting, particularly when they are found in highly visible and easily accessible areas. Additionally, if the human remains are reported, they are typically reported to the local police department which may have little experience with archaeological remains or no time or funds to monitor a burial site until mitigation can occur. This paper will present several cases where human remains from North Texas lakes were exposed during the 2011 drought and discuss the complications associated with their investigations. We will also present recommendations on what can be done to prevent some of these complications in the future.

Skipper, Jodi

[99] *Beyond the Dig: St. Paul United Methodist Church and Public Archeology in the Long Run*
 In 2002, archaeologists from the University of Texas at Austin excavated a shotgun house site adjacent to the historic St. Paul United Methodist Church in Dallas. The project later incorporated an interpretive history exhibition I designed after six years of archival and oral history research. In 2009, I presented the exhibition to help make the church's story more visible in its neighborhood, the Dallas Arts District, and to make the archaeological evidence more accessible to the local public. My initial project goal was to address how researchers can strategize with descendant communities to apply archaeological and historical resources in their cultural heritage initiatives, yet my interests shifted to questions about whether the church community saw my work as significant to its plight, as I did, and whether archaeologists should be addressing larger questions about ways to institute what I consider more preventive public archaeologies. I could then better understand how viable public archaeology projects actually are to community historic preservation, and how stakeholders actually perceive the work that is being done. This paper chronicles that journey.

Slater, Donald (Brandeis University & Robert S. Peabody Museum)

[109] *To the Four Corners: Fragmentation, Scattering, and Termination in the Caves of Ancient Central Yucatan, Mexico*
 This paper uses newly collected data and fresh interpretations to re-evaluate the assertion that most fragmentary cave artifacts were broken during termination rituals held inside of caves. Indeed, termination smash patterns have been convincingly documented by scholars in a number of Maya caves – however, a different pattern has been observed within those investigated by the Central Yucatan Archaeological Cave Project. This study uses the notions of fragmentation and scattering to explore a nuanced and multivariate alternative interpretation of the tens of thousands of artifacts deposited in four major caves in the Yaxcaba municipality of Yucatan Mexico. Analysis of these materials from Aktun Kuruxtun, Aktun Jip, Ikil Cave 1, and Cenote Ceh' Yax demonstrate that complete, intact artifacts were rarely deposited in these caves. Of the nearly 40K ceramic pieces recovered, none were found to form whole vessels. Bones from at least seven human individuals were documented, but no set of remains was even 10% complete. In addition, displaced architectural fragments from surface sites were found deposited within each of the study caves. This combined data, contrary to that documented at other

sites, suggests that regional variations in ritual cave activity may have existed among the ancient Maya.

Slater, Jessica (University of Sheffield) and Brad Comeau (ASM Affiliates, Inc)

[117] *Time, Space and Place: The Potential of Time/Geography, Geophysical, and Geochemical Approaches for Capturing Experimental Engagement*

Experimental archaeology is one of many heuristic devices at the disposal of those investigating ancient technologies. Though experimental (re)constructions of pyrotechnical equipment can aid in elucidating preferred operating conditions and constraints upon technical performance, seldom have these experiments been used to interrogate practitioners' real engagement with these productive features. Whilst no experimental construction can recreate past conditions--the experimenters' engagement is not a proxy for past practice--careful analysis of the individuals' bodily movement and engagement with the experiment can provide a complementary perspective to the more familiar work involving the analysis of geochemical and geophysical signatures of particular activities. A time/geographical approach was combined with geophysical and geochemical data to interrogate the observable relationship between practice and measurable changes in soil/sediments. Time-slice photography was utilized to carefully record practitioners' engagement with an experimental copper smelting furnace. These data were then compared to the magnetic susceptibility and portable XRF measurements taken on site over the course of the experiment. Results showed geophysical and geochemical enhancements in areas that correlated well with particular actions recorded by time/geography. In light of this work, researchers are encouraged to explore aspects of bodily engagement when investigating past arenas of technical performance.

Slater, Jessica [226] see Comeau, Brad

Slater, Philip (University of Illinois Urbana-Champaign), Stanley Ambrose (University of Illinois Urbana-Champaign), Polly Wiessner (University of Utah) and Marina Drigo (University of Illinois Urbana-Champaign)

[248] *Ostrich Eggshell Strontium Isotope Analysis: Preliminary Results and Implications for Reconstructing Prehistoric Exchange Systems in the African Late Stone Age*

Ostrich eggshell (OES) beadwork was the most common gift among contemporary Kalahari San foragers until the 1980s. Their reciprocal gift-giving (*hxaro*) networks spanned up to 200 km. They reinforced rights of access to distant territories for food and water resources, thereby reducing risk in unpredictable environments. Cooperation may have been essential in the last Ice Age, likely providing a social safety net in times of resource unpredictability and scarcity. Broken OES water bottles can also be recycled into beads, and so may also be used to trace networks. Strontium isotope analysis can be used to test hypotheses of differences in prehistoric exchange network and home range sizes in risky Pleistocene versus stable Holocene environments. Analyses were conducted on modern San OES beads from Botswana, modern OES fragments from the Kenya Rift Valley and Late Stone Age OES fragments from Enkapune Ya Muto rockshelter, dated 35-40 ka, in Kenya. Results show that, based on modern OES samples with known proveniences, $^{87}\text{Sr}/^{86}\text{Sr}$ isotope ratios can differ significantly among geographical regions. Analysis of Enkapune Ya Muto beads highlights the application of this technique to archaeological samples, which can be used to investigate the evolution of cooperative social networks and modern human symbolic behavior.

Small, David (Lehigh University)

[61] *Problems with Interpreting Ritual as either*

Corporate or Networking in the Archaic State

One of the reactions to neo-evolutionary theory has been the proposal of the dual processual model, which attempts to understand social evolution as developing along either a networking or corporate path. The identification of networking or corporate is often based upon an interpretation of socio-political rituals (here defined as a "prescribed form of conducting a formal secular ceremony") which appear to be dominant in social change and in the archaic state as an end product. My own research however, has led me to challenge several assumptions in this model's identification of corporate or networking rituals. I wish to discuss two points. First, archaic states are very much a mix of numerous social-political rituals, which are both corporate and networking. Second, socio-political rituals are often misidentified as corporate or networking, because archaeologists have failed to take a close look at the entire context of the ritual. Case studies from Mesoamerica and ancient Greek will be discussed.

Smee, David [122] see Wedding, Jeffrey

Smeltzer, Marion (Indiana U of Pa) and Beverly Chiarulli (Indiana U of PA)**[187] Practical Applications in Virtual Archaeology**

For the past few years, the presenter has been involved in an effort to expand archaeological experiences and knowledge to a wider audience through virtual world environments. This effort has made an impact in both educational and outreach programs. A virtual world is an internet based, simulated environment where motion enabled avatars, graphic images and 3D models represent people, places, and objects. As online learning becomes an important part of instruction in high schools and university settings, our challenge is to develop curricula that incorporates archaeology into these courses. Our goal as educators and developers is to create virtual learning environments that can be customized to accommodate each teacher's specific needs.

Smigelski, Ryan**[229] Calixtlahuaca: A Comparative Analysis on Urban Features and Politics**

During the current excavations at Calixtlahuaca, many aspects of its urban landscape have been uncovered. By using these details, my objective is to determine the political environment of the site. However, in Mesoamerican archaeology, there has been little evaluation of the politics in smaller city-states as compared to larger ones such as Tenochtitlan. In order to solve this dilemma, I compared Calixtlahuaca to two groups of Mesoamerican capital cities: (1) city-state centers such as Cholula, Tlaxcallan, various Aztec city-states; and (2) hillside sites similar to Calixtlahuaca in topographic placement. The importance of certain elements in these sites is more heavily considered than others and sites that have pre-existing knowledge about their political systems took precedence. By comparing urban aspects of these sites including location, population, density, urban layout, and urban architecture, I have created a model that relates urban form to political organization. I apply this model to infer the political organization of Calixtlahuaca. This model can later be applied throughout Mesoamerica and eventually to sites at other regions.

Smilansky, Uzy [247] see Grosman, Leore

Smith, Colin [20] see Guiry, Eric

Smith, Ian**[73] Schooling on the Missionary Frontier: The Hohi Mission Station, New Zealand**

Schooling played an integral part in the process of missionization

in most of the places where it occurred throughout the world. Whether in large institutional operations or small household missions, the teaching of literacy, artisanal skills and selected social behaviors were frequently at the forefront cultural engagement, yet this process has scarcely been explored through the archaeological record. Excavations at Hohi, New Zealand, located the first school founded by CMS missionaries in 1816, providing a material record that, in conjunction with documentary sources, enables reconstruction of schooling during the earliest stages of cultural engagement in this part of the Pacific. The motivations and agency of both missionaries and indigenous Maori in the establishment, stuttering progress, demise and aftermath of this school are described, and implications for mission archaeology throughout the Pacific are considered.

Smith, Sean**[107] El cambio social en la Región de los Tres Valles en el altiplano central jalisciense.**

La relevancia que implica el cambio social en la teoría antropológica generó distintos postulados teóricos que buscan explicar la raíz causal de este fenómeno.

Con la llegada de teorías evolucionistas unilineales, se ha intentado describir los estados que representan el cambio en distintas épocas. Service, por ejemplo, definió en Bandas, Jefaturas y Estados, a los períodos que una sociedad debería de transitar a través de su historia, (Service, 1962) en Mesoamérica se utilizan los términos formativo-clásico-posclásico como etapas de evolución. Es pues importante establecer que, aunque el cambio a sucedido desde hace miles de años, no significa una mayor complejidad o una continuidad en el crecimiento a través del tiempo, el cambio no es unidireccional (Feinman, 2000). El colapso de la Tradición Teuchitlán (350/450 d. C.) y la aparición de la Tradición Grillo (450 d. C.) en la región de los tres valles es un buen ejemplo de ello ya que, aunque es evidente que existió una discontinuidad cultural en este periodo, no se puede concluir que este hubiese generado un incremento en la complejidad social de la región.

Smith, Bruce (Smithsonian Institution)**[283] The Onset of the Anthropocene**

Scholars from across a range of disciplines have proposed a number of different starting dates for the Anthropocene Epoch, based on different perspectives and criteria regarding when human societies first began to play a significant role in shaping the earth's ecosystems. We briefly describe these different perspectives regarding the beginning of the Anthropocene, and then outline an alternative approach that employs Niche Construction Theory (NCT) to consider the temporal, environmental and cultural context for the initial development of the human behavior sets that allowed human societies to modify species and ecosystems more to their liking. The initial domestication of plants and animals, and the development of agricultural economies and landscapes is identified as marking the beginning of the Anthropocene Epoch.

[116] Discussant**Smith, Lisa (University of Montana)****[120] People Occupied Small Villages Too: Household Archaeology of Housepit 1 of the S7i7stkn Site (Little Pithouse Site), Middle Fraser Region, British Columbia**

Archaeological research of complex hunter-gatherers of the Middle Fraser has focused primarily on large pithouse villages, particularly Keatley Creek and Bridge River. This poster highlights research conducted at the S7i7stkn site, a small pithouse village located near Bridge River, with dated occupations spanning ca. 540-1190 B.P. Investigations focus on Housepit 1, the largest house of the site, occupied after the breakdown of large aggregated villages in the region, and just prior to contact. Using

spatial analyses and drawing from theoretical frameworks of household and practice theory, this research provides unique opportunity to understand intra household dynamics, including socioeconomic and political structures, in vastly under researched small village and late precontact contexts.

Smith, Larissa (University of Illinois at Chicago)

[130] *Interpreting the Resiliency of Tropical Foragers through 1500 Years of Culture Change*
The emergence of ethnoarchaeology as a methodological tool for anthropologists and archaeologists alike has allowed access to what was once thought of as inaccessible information on non-literate, small-scale societies. Ethnographic methods focused on materialized behaviors and ideologies can provide tremendous insight into the social practices and cognition of foragers, particularly in cases of historical continuity. Most significantly is the access that ethnoarchaeology allows to more innovative interpretations of how foragers not only have adapted to cultural impacts by other groups and processes of modernization, but the specific ways in which traditional forager lifeways and belief systems remain resilient despite these impacts. This paper presents ethnographic field research, historical analysis, and settlement archaeology documenting more than 1500 years of interaction between Aeta foragers and lowland agricultural societies centered around maritime trading chiefdoms and later the colonial and modern Philippine state on Negros Island in the Philippines. This research shows that while Philippine foragers, and foragers throughout Southeast Asia, have undergone significant political, economic, social and culture changes, they have been both highly adaptable and resilient by maintaining essential elements of social structure, landscape use, and ideology that are visible in the archaeological record.

Smith, Erin (Washington State University, Pullman) and Colin Grier (Washington State University, Pullman)

[170] *Thinking By Boat: Developing a Phenomenology of Seascapes for the Coast Salish World*
In his 2002 paper titled "Going by Boat", Ames explores how the use of boats affects the application of forager-collector models on the Northwest Coast. This framework has been influential, and has been applied by others on the coast and elsewhere, but primarily to assess the impact of watercraft on transport costs. Here, we conceptualize the role of watercraft by focusing on phenomenological aspects of going by boat in the Salish Sea. Specifically, we consider how life in boats and on water structured decisions, perceptions, and movements within an island archipelago setting. We first consider past attempts to theorize in this direction and then present examples that illustrate Coast Salish conceptions of how their seascapes are assembled. Within this more humanized and historicized framework, our goal is to move beyond solely theorizing these relationships. We consider shell middens and the materials they contain as more than a representation of generalized forager-collector patterns, but rather as providing a compressed window into daily actions and negotiations of the natural and social world. We illustrate our approach by unpacking a recently excavated village site midden at the Dionisio Point locality on Galiano Island in coastal southwestern British Columbia.

Smith, Kevin

[189] *REVEALing the End of the World? 3D Imaging and Documentation of Surtshellir, a Unique Subterranean Viking Age Site in Iceland's Interior*

Inside one of the world's longest lava caves, on the edge of western Iceland's inhabitable fringe, are (1) a massive subterranean wall, (2) an unprecedented Viking Age structure, and (3) a pile of domestic animal bones, crushed, chopped, burned, and thrown from the structure deeper into the cave. This unique archaeological site, Surtshellir, was named for the anti-god, Surtur, that Iceland's Viking Age Norse settlers believed would bring

about the destruction of the world, mankind, and the old Norse gods. Later medieval traditions from this district variously associated the cave with rituals to appease Surtur's wrath, with outlaws threatening to disrupt regional political order, and with violent encounters among elites during Iceland's state-formation process. Surtshellir was first documented archaeologically in 2001 and in August 2012 we used REVEAL – an innovative NSF-funded, open-source program for archaeological data recording, low-tech 3D imaging, and data analysis from Brown University – to document the unique structures within this cave and to assess their roles within Viking Age and Medieval Icelandic society. This poster reveals REVEAL and suggests that while Surtshellir may have had many uses, it seems more likely a sacrificial site linked to Viking Age cosmology than a home for outlaws.

[189] *Chair*

Smith, Michele (Research Associate Haffenreffer Museum of Anthropology)

[189] *The Cloth I Wove (Tiddly Pom) Didn't Warm My Toes (Tiddly Pom)... And So I Froze (Tiddly Pom) during the Little Ice Age: Climate Change and Textile Production during the Little Ice Age in Iceland and Greenland*

Textiles used for clothing provide direct evidence of cultural adaptations to climate change, the roles of textile producers as decision-makers adjusting to climate change, and regional variability in strategies responding to local and regional patterns of climate change. Over the past three years, an NSF-funded project, Rags to Riches, has been examining archaeologically recovered textiles from Iceland from the island's settlement, around AD 874, until A.D. 1800. Textile technologies are often conservative, yet the long time span covered by this project has enabled changes in weaving patterns to be tracked over a millennium. With data from 31 sites, important changes are noted in the production of homespun cloth dating to the 17th-18th centuries. These differ significantly from their earlier medieval counterparts and coincide with a crucial period of declining temperatures and increased climatic variability in Iceland during the Little Ice Age. Comparable technological changes in Greenlandic textile collections of the 14th and 15th centuries, especially at the site of Tasipataakilleq (Ø172), suggest similar decision-making processes coincident with initial climatic cooling in Greenland, with different outcomes. This poster explores these changes, examining divergent adaptive strategies to climate change through material culture at the levels of the individual and the region.

Smith, Michael (Arizona State University)

[229] *Archaeological Fieldwork at Calixtlahuaca*

The city of Calixtlahuaca, also known as Matlatzinco, was capital of the Toluca Valley of central Mexico during the Middle and late Postclassic periods, A.D. 1100 – 152. José García Payón's 1930s excavations targeted the monumental architecture and recovered sculptures and burial offerings. During 2006 and 2007, the Arizona State University project surveyed the site and excavated houses and terraces. The papers in this symposium present new data on the economic, political, and urban organization of the ancient city. In this paper I review the work of the ASU project and introduce the papers that follow through a brief comparison of Calixtlahuaca with other Aztec urban centers.

Smith, David (University of Toronto, Mississauga)

[254] *Introduction to People and Plants: Migration and Exchange in the Circum-Caribbean*

This paper introduces the topic of migration and exchange within the Greater Circum-Caribbean, in an attempt to examine the potential routes of both people and plant movements between the islands and with mainland(s) in the region.

[254] *Chair*

Smith, Craig (Cardno ENTRIX)

[278] *Hunter-Gatherer Resource Sharing and Public Goods: An Archaeological Consideration from the Elk Head Site, Wyoming*

An important distinction between hunter-gatherer adaptive strategies are those that share and treat resources as public goods, lack long-term storage, exploit foods with low handling times, and are residentially mobile, and those that consider goods as private property, have long-term storage, procure resources with high handling times, and are less residentially mobile.

Archaeological clues suggesting strategies focusing on public goods and sharing include evidence for sharing such as artifact refitting and close spacing of dwellings. The study of three contemporaneous, closely spaced houseplots at the Elk Head site in the Big Horn Basin of Wyoming dating to the mid-Holocene provides an opportunity to explore these lines of evidence.

Smith, Anita (La Trobe University)

[292] *Archaeology and World Heritage in the Pacific Island Nations*

Since 2004 the Pacific World Heritage 2009 Program has sought to increase representation of the Pacific Island nations on the World Heritage List leading to the nomination of six cultural or mixed cultural and natural properties of which four are now inscribed on the World Heritage List. A further three cultural nominations are in development.

In seven of these properties the outstanding universal values are expressed in archaeological evidence recovered and interpreted through international research projects led by non-local researchers. This emphasis on archaeological research in identifying the properties worthy of World Heritage status suggests a form of neo-colonialism, a reflection of the values of the international community and not necessarily those of communities in the Pacific.

In this paper I argue through case studies of current and potential Pacific World Heritage sites that although their focus on archaeological knowledge is a form of neocolonialism - an historical legacy of the World Heritage List and European colonization in general - the development of nominations in a region where traditional land tenures mandate community consultation and management means archaeological knowledge is reinterpreted and re-contextualized within the values and priorities of Indigenous Pacific communities.

Smith , Geoff [128] see Pattee, Donald

Smyth, Michael [144] see Dunning, Nicholas

Snead, James (California State University Northridge)

[110] *Discussant*

Snead, James [287] see Kolb, Michael

Snetsinger, Andrew [65] see Lamoureux St-Hilaire, Maxime

Snitker, Grant (Arizona State University), Andrea Torvinen and Rhian Stotts

[207] *Testing the Application of Adaptive Governance of Common Pool Resources: An Archaeological Perspective*

In 1968, ecologist Garrett Hardin published an article in the journal Science titled "The Tragedy of the Commons." Hardin outlined a scenario in which a resource environment that is open access is

depleted. The scenario that he presented is one caused by users who overexploit a common pool resource (CPR) due to self-interested resource use. Hardin argued that the only way to mitigate these effects was to centralize control over the resource. However, Ostrom and colleagues have proposed adaptive governance, which emphasizes self-organization and self-governance, as a strategy for long-term sustainable management of CPRs.

Adaptive governance relies on an understanding that successful management of resources is dependent upon multiple variables, including resource type, users, and the social, economic and political settings within a resource environment. This poster presents two archaeological cases of adaptive governance strategies implemented on CPRs during the Norse occupation of the North Atlantic. We describe each case using Ostrom's Social-Ecological System (SES) Framework in order to determine which of Ostrom's eight design principles can be identified through archaeological data. This will provide a model for future analysis of archaeological cases that will strengthen the understanding of the long-term implementation of adaptive governance strategies.

Snodgrass, Josh (University of Oregon) and William Leonard (Northwestern University)

[212] *Effects of Social and Environmental Change on the Biology and Health of Contemporary Human Populations: A View from Siberia*

This paper provides a window onto the effects of human niche construction through its examination of the consequences of social and environmental change on the biology and health of an indigenous herding population from northeastern Siberia. Research conducted by the Indigenous Siberian Health and Adaptation Project has shown that the Yakut (Sakha) are biologically adapted to chronic cold stress, displaying an upregulated basal metabolic rate (BMR) relative to lower latitude groups. The Yakut are also in the midst of major transformations in culture and lifeways precipitated by regional economic development. These changes include shifts in diet, activity patterns, subsistence participation, and demography that are contributing to increased chronic health problems such as obesity and cardiovascular disease. Over the past few years, our research indicates that there has also been an adaptive shift with a substantial decline in metabolic rates (i.e., decreased upregulation of BMR) that appears to be driven by reduced exposure to the cold (as a result of declining participation in the subsistence economy) and dietary change (increased consumption of market foods high in refined carbohydrates). These findings emphasize the need to consider how human-induced modification of the environment can have important consequences for adaptation and health.

Snodgrass, J. Josh [215] see Anton, Susan

Snow, Dean (Pennsylvania State University)

[257] *Teaching Archaeology in the Information Age*

I currently teach two courses, neither of which is structured anything like the standard courses of my own undergraduate and graduate education. One has enrollments consistently exceeding 100 and is taught entirely online. The other is limited to 30 students and is structured around writing and hands-on lab and field exercises. Neither depends much on traditional lectures, term papers, films, or traditional class scheduling. Archaeologists are fortunate in that archaeology lends itself to teaching and learning techniques that take advantage of the ways that contemporary students are most effectively educated.

Snow, David [267] see Eckert, Suzanne

So, Sangyoung (Hangyang University Museum)

[22]

The Location of Neolithic Sites in Central-Western Korea Related to the Change of the Holocene Environment

The locations of Neolithic sites in Central-Western Korea are divided into Phase I (~5,000-3,500 B.C.) and Phase II (~3,500-1,500 B.C.). During Phase I, settlements were primarily located in floodplains in the inland, while shellmiddens were more frequently located on hills when on island locations. Phase II settlements and shellmiddens had a tendency to be more heavily concentrated in coastal areas and on islands; this may be possibly related to a change in diet. During Phase II, settlement sites in the inland floodplains mostly disappeared. From our data it appears that settlements moved to the foothills around the tributaries and estuaries of rivers. It should be noted that our Phase II sample size is relatively small. We argue here that such changes in settlement patterning from Phase I to Phase II can be attributed to climatic fluctuation and bathymetric rise since ~3,500 B.C. A decrease in temperature during this time period would have resulted in a reduction of inland resources. As such, it may have been the primary causal factor for human migrations to the coast and islands during Phase II.

Sobotkova, Adela [185] see Crook, Penny

Sobur, Marta (Harvard University)

[157] *Karl Polanyi's "Ports-of-Trade" and Their Manifestations during the Bronze Age across the Arabian Peninsula*

In his prolific treatment of ancient trade relations, the economic anthropologist Karl Polanyi proposed the complex idea of "ports-of-trade" to explain the process of long-distance exchange and its existence without the principle of reciprocity. For the past half a century, the "ports-of-trade" served as interpretative framework for archaeologists working on all aspects of commerce in all corners of the Old and the New World. As such, they became adapted from Polanyi's original idea to accommodate regional particularities, for instance evolving so far as to render the maritime trade component of the port optional, and thus increasing their application and their relevance to new data. In this paper, I examine the theoretical underpinnings of such "ports of trade" and interrogate the resulting model with data derived from the third millennium B.C. sphere of economic interactions in the basin of the Persian Gulf and the Indian Ocean. In particular, I focus on the relationship between the Indus Valley and south-eastern Arabia. Although it has been accepted that they have maintained commercial contacts with each other in the third millennium B.C., the exact mechanisms of those interactions are only now emerging through archaeological fieldwork on the coast of the Sultanate of Oman.

Soderberg, John (University of Minnesota)

[211] *Ceremonial Complexity: The Roles of Religious Centers in Ireland from the Later Iron Age into the Early Medieval Period*

Bernard Wailes' excavations at Dún Ailinne brought the Iron Age ceremonial centers of Ireland to bear on models of social complexity among North American archaeologists. One challenge in fully tracing out the implications of Dún Ailinne was that very little was otherwise known about Iron Age Ireland. Little could be said about the articulations between ceremonial centers and their surrounding landscapes because few other settlements were known. The surge of excavation in Ireland that occurred over the last two decades has fundamentally altered that situation. Emerging perspectives on religion also make this an opportune time to re-evaluate what Ireland has to offer the study of social complexity. This paper presents new information on animal bone assemblages from two medieval religious sites in western Ireland and evaluates that information in the context of what we have learned in recent years about ceremonial centers from both the Iron Age and the medieval period. The primary question

considered is what do these centers reveal about the dynamics of social complexity in Ireland between the last centuries BC and the middle of the first millennium AD.

[94] *Chair*

Soderberg, John [94] see Knigge, Ryan

Sofield, Clifford (The Queen's College, University of Oxford)

[55] *"Funerals" for Buildings in Anglo-Saxon England*

The life histories of buildings are punctuated by critical events such as construction, modification, abandonment, and demolition. These events may be linked to household dynamics or the human lifecycle; for example, some communities in the American Southwest have been reported to burn down buildings upon the death of an inhabitant. Theories of cultural biography, however, suggest it is possible to consider buildings as having "lifecycles" of their own. Ritualized activities performed at critical events within these lifecycles may represent "rites of passage." This paper will examine material deliberately deposited (or "placed") during the abandonment and demolition of sunken-featured buildings (Grubenhäuser) in Anglo-Saxon England in the 5th–9th centuries A.D. In particular it will consider placed deposits of looms and/or loomweights, ceramic vessels, and cattle and horse heads stratigraphically associated with the building's destruction. Both placed deposits and the demolition of buildings may have been elements of a rite of passage in the lifecycle of the building analogous to a funeral. Gendered, symbolic, and even totemic connotations carried by the objects in the placed deposits will be explored in order to suggest why some buildings were given "funerals" in Anglo-Saxon England.

Solis-Pichardo, Gabriela (Instituto de Geología, Universidad Nacional Autónoma de México), Peter Schaaf (Instituto de Geofísica, Universidad Nacional Autónoma de México), Teodoro Hernández-Treviño (Instituto de Geofísica, Universidad Nacional Autónoma de México), Becket Lailson-Tinoco (Coordinación de Ciencias Sociales y Humanidades, U) and Linda R. Manzanilla (Instituto de Investigaciones Antropológicas, Unive)

[17] *Migration in Teopancazco, Teotihuacan: Evidence from Sr Isotopic Studies*

Strontium isotope ratios have been successfully used for more than twenty years as a geochemical tracer to solve archaeological questions concerning human migration. Provenance studies require comparison between the $^{87}\text{Sr}/^{86}\text{Sr}$ found in human tissue (bones and tooth enamel) and the $^{87}\text{Sr}/^{86}\text{Sr}$ from the soil where the remains were unearthed or with $^{87}\text{Sr}/^{86}\text{Sr}$ from another specific geographic region related to the mobility of the individual. In this study we analyzed strontium isotope ratios in bone and tooth enamel from 27 burials excavated at the Teopancazco neighborhood center (in Teotihuacan), central Mexico. Since strontium is incorporated into the skeletal system through nourishment, we also determined Sr isotopic signatures of the plants that grew in the soil from where the ancients inhabited. In this way an $^{87}\text{Sr}/^{86}\text{Sr}$ database was established from different localities related to archaeological regions in Veracruz, Morelos, Puebla and Tlaxcala. A migration context was recognized in ten individuals originating probably from Tula, Hidalgo, Oaxaca, Tepexi, Perote and Chiapas. Five others migrated from nearby sites in the Altiplano. Twelve individuals were identified as locals. In the case of migration evidence, we compared bone $^{87}\text{Sr}/^{86}\text{Sr}$ with our soil and plant database, as well with delta ^{18}O values, to further help determine possible origins.

Solís-Pichardo, Gabriela [17] see Schaaf, Peter

Somers, Lewis [34] see Hargrave, Michael

Somerville, Andrew (University of California, San Diego)

- [138] *Ethnobiarchaeology in the Pacific: Stable Isotope Analysis and Dental Health of the Mulia Dani, Papua, Indonesia*

Modern Melanesian peoples of the Western Pacific inhabit a wide array of environmental zones, ranging from mountain forests to coastal biomes. The peopling of these areas and the local development of each region, however, remain poorly understood. The present "ethnobiarchaeological" study investigates the dietary patterns of the Mulia Dani, a modern, ethnographically known population of sweet potato horticulturalists from the central highlands of Papua, Indonesia. We analyze carbon ($\delta^{13}\text{C}$) and nitrogen ($\delta^{15}\text{N}$) stable isotopes of hair samples ($N = 116$) and evaluate the dental health of Dani participants ($N = 477$), quantified by the number of carious teeth. In total, we include seven villages from Mulia, and individual participants represent all age groups, both sexes, and several different professions. Quantified dietary data are evaluated alongside demographic and ethnographic variables to provide a nuanced view of how isotopic and dental health values vary across a Melanesian horticultural society. Results are relevant to questions concerning the arrival of sweet potato horticulture in Oceania, gender roles in Melanesian prehistory, and the socio-political organization of highland communities.

- [138] *Chair*

Somerville, Andrew [138] see Somerville, Andrew

Somerville , Andrew [256] see Fauvette, Mikael

Sommer, Caitlin (Crow Canyon Archaeological Center)

- [43] *Animacy, Symbolism, and Feathers from Mantle's Cave, Colorado*

This research asks to which native group or groups can the Mantle's Cave artifacts be attributed. The most spectacular artifacts recovered incorporated feathers. Feathers have great symbolic significance to many modern native groups, and so may afford archaeologists an exceptional view into the past. Analysis of feather bundles and feathered artifacts from the cave should assist in determining ethnicity. Moreover, this inquiry will explore agency of feathers and the symbolism of birds and feathers for modern Puebloan, Great Plains, northern Mexican, and Great Basin groups.

Sommer, Caitlin [184] see Copeland, Steve

Song, Sanghoon [22] see Bhak, Jong

Song, Yanbo (Shandong University), Fen Wang (Shandong University) and Guiyun Jin (Shandong University)

- [66] *New Investigation of the Animal Resources in Neolithic Shandong Peninsula: A Case Study of Beiqian Site*

Recent study of the Beiqian site has shed new light on the understanding of the exploitation strategy and uses of animal resources in Neolithic Shandong Peninsula. Quantitative analysis of the fauna indicates that domesticated pigs were the main and stable meat resource at this settlement. Shellfish and deers were also major food resources. The data also suggest that different households preferred different meat resources. Pigs, oysters, fish were also used as funerary offerings.

Song Hanyu, Becky [184] see Macy, Kimberly

Sonnenburg, Elizabeth (University of Michigan Museum of Anthropology)

- [98] *Microscopic Analysis of Submerged Landscapes of the Alpena-Amberley Ridge*

The study of microdebitage, testate amoebae and sediment particle morphology hold great potential for locating, reconstructing and characterizing ephemeral pre-historic sites in areas that are difficult to excavate with traditional archaeological methods, such as submerged sites. In Lake Huron, large tracts of land have been inundated since the Lake Stanley lowstand phase (ca. 9.9- 7.9 ka B.P.). During this time of lowered water-levels (up to 100 m below present levels), the Alpena Amberley Ridge was a sub aerially exposed causeway that bifurcated Lake Stanley. In this study, microdebitage, testate amoebae and sediment particle morphology are used to investigate the Alpena Amberley Ridge, where several stone features and modified wood from 8.9 ka B.P. have been located at a depth of 25-35 m. Microdebitage help identify which of the features are anthropogenic. Testate amoebae locate wetland areas and detect water-level fluctuations. Finally, particle size morphology provides insight into taphonomic and surficial processes. All of these methods are easy to extract from sediment grab samples and initial identification can be completed with a standard light microscope before final detailed characterization with Scanning Electron Microscopy.

Sparrow, Melanie [213] see Chenault, Nicole

Spatz, Ashton (College of DuPage and Moraine Valley Community College)

- [248] *Ornamental Shell Beads as Markers of Exchange in the Pre-Pottery Neolithic B Southern Levant*

Ornamental shell beads can inform archaeologists about many aspects of daily life in the past. Beads made of marine mollusc shell can be particularly useful in terms of analyzing exchange in prehistory, since shells are one of the classes of material culture that allow archaeologists to trace trade routes as they can be sourced to their area of origin. The mollusc shells recovered from Pre-Pottery Neolithic B (PPNB) period sites in the southern Levant provide clear evidence for long-distance exchange being present in the region because these shells are found at great distances from their marine sources of origin – the Red Sea and Mediterranean Sea. In order to better understand these exchange networks, mollusc assemblages from several PPNB sites in the southern Levant are examined to evaluate if they conform to a down-the-line exchange model. The shells are also analyzed to determine if they are being traded as raw material (i.e., complete shells) or as finished products (i.e., beads). This paper will discuss the results of these analyses as well as the implications of this research in regard to the PPNB southern Levant.

Speller, Camilla [71] see Roth, Melissa

Speller, Camilla (Archaeology Department, Simon Fraser University), Lorenz Hauser (School of Aquatic and Fishery Sciences, University), Dana Lepofsky (Department of Archaeology, Simon Fraser University) and Dongya Yang (Ancient DNA Laboratory, Department of Archaeology,)

- [172] *Using DNA from Ancient Herring Bones to Inform Modern Fisheries Management and Conservation*

Pacific herring (*Clupea pallasi*) are an abundant and important component of the coastal ecosystems for the west coast of North America. Indigenous traditional knowledge and historic sources suggest that locally adapted, distinct regional herring populations may have been more prevalent in the past than today. Within the last century, commercial fishing and other anthropogenic factors have resulted in severe declines of herring populations, with contemporary populations potentially reflecting only the remnants of a previously more abundant and genetically diverse

metapopulation. Through the analysis of 85 archaeological herring bones, this study attempted to reconstruct the genetic diversity and population structure of ancient herring populations using mitochondrial and nuclear DNA. A high success rate (91%) of DNA recovery was obtained from individual herring bones weighing less than 10mg. The ancient herring mtDNA revealed high haplotype diversity comparable to modern populations. Ancient microsatellite diversity was also similar to modern samples, but the data demonstrated some evidence for large allele drop-out and stuttering. SNPs were found to have low error rates, presenting the most feasible method for identifying distinct ancient populations. This study provides the foundation for wider scale studies on ancient herring genetic variation, with important implications for fisheries management and conservation.

Spenard, Jon (University of California, Riverside)

[109] *Just How Far Do We Go in "Cave" Archaeology? A Discussion of the Modified Karst Landscapes around Pacbitun, Belize*
 Archaeology in the Maya area is regularly divided into "surface," and "cave" brands. Surface archaeology usually focuses on ancient settlement or agricultural remains, while cave archaeology tends to focus on any area behind drip lines. Recent investigations in the Nohoch Tunich bedrock complex and Actun Lak cave near the ancient Maya center of Pacbitun, Belize have documented extensive architectural and other modifications to these features that challenge this dichotomy. Instead, I argue for a holistic approach that combines the two archaeology brands. Excavations in the Nohoch Tunich complex uncovered terraces, rock alignments, and a structured deposit that was the foundation for a raised earthen platform. Those undertaken within Actun Lak cave documented formation breakage, rock placements, and terraces. Investigations outside uncovered an earthen platform at its entrance, and a staircase leading downhill towards a seasonally active arroyo that drains into a larger cave. These findings suggest that cave features should not be considered in isolation from the landscapes of which they are a part, but rather as parts of them in order to obtain a more comprehensive understanding of their roles and uses in ancient society. Simply put, we need to leave the caves in order to understand them.

Spence, Michael (University of Western Ontario)

[24] *Urban Borderlands: The Oaxaca Barrio of Teotihuacan*
 Although we tend to think of a borderland as a development characteristic of the periphery of a society, it can also be a useful concept for exploring the survival of enclaves in urban contexts. In these cases distance is not as significant a factor as the filters that each community puts in place to protect itself. In the case of the Oaxaca Barrio of Teotihuacan, location, architecture, and ritual all had crucial roles in the control of interaction with the larger Teotihuacan community in which the enclave was embedded. Other important elements in the Barrio's survival were its relationships with similar enclaves elsewhere in central Mexico and with a neighboring enclave of Michoacanos in Teotihuacan.

Spencer, Charles and Elsa Redmond (American Museum of Natural History)

[56] *Investigating the Emergence of Internally-Specialized Governance at El Palenque, a Late Formative Site near San Martín Tilcajete, Oaxaca*

In 2006, Henry Wright encouraged archaeologists to focus on documenting the emergence of specific institutions of state governance, which he noted will require finer-grain chronologies than have typically been used in past studies. In this paper, we present the results of 20 years of survey, excavation, and analysis at two Middle and Late Formative sites near San Martín Tilcajete, in Mexico's Oaxaca Valley. These sites, known locally as El Mogote and El Palenque, have public plazas that were occupied successively, allowing us to compare the institutional architecture (public buildings) of the Early Monte Albán I phase (500-300 B.C.)

and the Late Monte Albán I phase (300-100 B.C.). We describe our horizontal excavations of several institutional buildings and discern their sequence of construction by considering the ceramics and, especially, the radiocarbon dates associated with each structure. The evidence indicates that institutions of internally-specialized governance appeared at El Palenque around 300 B.C. We discuss the significance of this development in relation to the contemporaneous rise of the nearby Monte Albán state.

Spencer, Charles [178] see Minc, Leah

Spencer-Wood, Suzanne (Oakland University and Harvard University)

[100] *Why Has Poverty Been Neglected in Prehistoric Archaeology?*

There are many reasons why poverty has seldom been researched in archaeology. The Western stigmatization and criminalization of poverty have resulted in modern avoidance of the issue that is projected back into the past. Some archaeologists may worry about stigmatizing people in the past by calling them poor. Archaeological concepts of culture do not include the destitute in ranked or class societies. Impoverishment, poverty, the poor, and destitution have not been conceptualized or theorized in archaeology. Archaeologists have historically focused on the rich material cultural of the wealthy. The power dynamics resulting in the enrichment of a few people and the impoverishment of many in ranked and class societies have rarely been researched. In patriarchal societies many of the poor are invisible women. The paucity of material remains left by poor people has contributed to their neglect because archaeology analyzes material culture. And to confuse things, little material culture is also left by some high status groups, such as monks. It is time to overcome the barriers and theorize how poverty is related to a lack or presence of certain kings of material culture in different societies.

Spielmann, Katherine [10] see Kintigh, Keith

Spielmann, Katherine (Arizona State University)

[218] *Discussant*

Spittler, Ryan (Indiana University of Pennsylvania)

[187] *Locating the French and Indian War Era Native American Settlement at Aughwick Old Town*

During the French and Indian War, between the summer of 1754 and the fall of 1756, a unique engagement between Native Americans and colonists occurred. Situated in Aughwick Old Town (present day Shirleysburg, Pennsylvania), approximately 200 Native Americans were settled in wooden cabins near Fort Shirley. Today, no visible trace of the Native American settlement or the fort exists. The little that is known about these circumstances comes from various historical documents. More recently, archaeological excavations being conducted in Shirleysburg have resulted in successfully locating Fort Shirley, but the exact location of the associated Native American settlement, Aughwick Old Town, is still unclear. This poster outlines the ongoing investigations to locate the Native American settlement. Extensive historical research, archaeological geophysical surveys, and archaeological artifact analyses have provided new insights into this unique part of the French and Indian War.

Spittler, Ryan [187] see Meyers, Cory

Spivak, Deborah [19] see Gallow, Lauren

Spivak, Deborah (University of California, Santa Barbara)

- [214] Were the Nasca "Nasca" in the Middle Horizon?**
 The chronology of the Nasca culture is considered to end with the gradual disintegration of Nasca society as the Wari empire conquered the region in the beginning of the Middle Horizon. Holding the fine polychrome Nasca ceramics in high esteem, scholars associate the deterioration of Nasca culture with the reduction in quality of the local MH Loro pottery. The intrusion of imperial sites, ceramics, and elites support this argument of a loss of Nasca-ness in the MH. However, closer examination of the limited available archaeological data reveals that a significant amount of what characterized the EIP Nasca society continued throughout the MH. While the Wari presence greatly influenced the political, economic, and social landscape of the south coast, the local changes are in concordance with the pattern of adaptation that characterized EIP Nasca. The Loro ceramic style offers insight into the ways in which the Nasca developed to fit their changing world. Instead of causing the destruction of the Nasca culture, the Wari presence encouraged the reinforcement of Nasca identity and ways of life, visible in ceramics, bioarchaeological evidence, settlement patterns, and sacred landscape.

Spott, Elizabeth

- [44] An Examination of Gender, Class and Identity: A Comparison of Material Culture from the Chief Richardville House and the Richardville-Lafontaine Site**

Jean Baptiste de Richardville served as chief of the Miami tribe from 1816 to 1841. During his tenure as chief he lived in the Chief Richardville House, a treaty house constructed in the Greek-revival structure in 1827, as well as the Richardville-Lafontaine house, a simple two-story L-shaped, wood frame house built at the Forks of the Wabash in 1833. A comparison of materials recovered from these sites will be conducted and examined through a feminist framework to determine whether differences between the assemblages reflect differences in identity, gender or class roles fulfilled by Richardville and his wife Natoequa at each site.

Spriggs, Matthew [27] see Herrscher, Estelle

Spriggs, Matthew

- [292] Mission Sites as Indigenous Heritage in Vanuatu**

Christian missions are often characterized as a physical expression of Western colonial power, institutions that were then resisted by indigenous people in various ways. In Vanuatu, while there was sometimes dramatic resistance to mission incursion, as with the well-publicized martyrdom of several Presbyterian missionaries on Erromango, the success of Christianity in some places (for not everyone converted) must be attributed to indigenous agency, rather than missionary heroics. This is apparent both in oral traditions about mission encounters, and in the physical remains of mission sites. Specifically, mission architecture in Vanuatu is probably best understood through the lens of syncretism or hybridity, rather than as belonging to one group or another. Indigenous ni-Vanuatu see mission sites in the present as an integral part of their heritage, rather than as relics of a colonial past. The historical archaeology of missionary buildings, especially churches, in southern Vanuatu, destabilizes categories such as colonizer/colonized, indigenous/foreign, and power/resistance. The way these structures are seen in the present, and evidence for how they were used in the past reveals the permeability of colonial space, leaving archaeology to interpret these places as neither totally local, nor totally introduced, but rather as examples of something new.

- [195] Discussant**

- Sprowles, Michael (Oak Ridge Institute for Science and Education / US Army - Fort Drum)**

- [40] A Year in the Necropolis: Digitizing Historic Cemeteries for Optimum Resource Management, Public Dissemination, and Research Potential**

Fort Drum Military Installation consists of 107,265 acres, eight historic villages and hamlets, and 13 associated cemeteries (some of which are still active). Between the summers of 2011 and 2012, the cemetery markers were surveyed, geo-referenced, and entered into a database. The information from these 2,177 identified markers (and 1803 individuals) was organized to optimize attribute referencing. The digitized result allows for referencing based on information such as: the marker's condition, environmental factors, cemetery landscape location, associated individual's information, or demographic information. This poster presents some of the direct and indirect applications of digitizing any resource.

- Spurling, Amy, Mary Ann Vicari (SWCA Environmental Consultants), Victor Villagran (SWCA Environmental Consultants) and Lisbeth Louderback (University of Washington)**

- [87] Investigating Ancestral Puebloan and Numic Occupations in Coyote Springs Valley, Southeastern Nevada**

The excavation of six prehistoric sites within Coyote Springs Valley, southeastern Nevada for the ON Line Transmission Line Project lends insight into lifeways of Ancestral Puebloan and Numic groups in the southeastern Great Basin. Macrobotanical remains from nine prehistoric hearth features provide new data on the antiquity of the intensive exploitation of *Yucca brevifolia* (Joshua tree) and *Yucca schidigera* (Mojave yucca) and the use of yucca roasting pits documented ethnographically. A new suite of radiocarbon dates, in addition to obsidian hydration data, establishes a temporal framework for Formative and Late Prehistoric Period occupations of the valley, and contributes to regional chronology-building for the southeastern Great Basin area. Excavation of a large prehistoric habitation site revealed numerous intact, stratified features preserved within stabilized eolian dunes. The site exhibits distinct intrasite spatial structure, providing a unique opportunity to investigate the partitioning of social and activity space with respect to the natural environment. Geoarchaeological analyses of sedimentary deposits characterize the site's geomorphic heterogeneity and assess potential for post-depositional alteration of cultural materials.

- Stack, Adam (Harvard University)**

- [200] Landscape Continuity and Change at Hacienda Quispicanchis**

Both Inka and Spanish elites manipulated the environment of Cuzco and its surrounding region as a means to establish, proclaim, and perpetuate power. Inka rural palaces combined natural resources, landscape capital, and monumental architecture in politically charged spaces that, in many cases, subsequently anchored the estates of colonial aristocrats. Beginning in the late sixteenth century A.D., the Inka royal complex known as Tipón was subsumed into Hacienda Quispicanchis, one of the largest and most important rural estates of the colonial period. Taking the hacienda as a focal point, this paper examines continuities and ruptures in the configuration of landscapes and politics between the late pre-Columbian and colonial periods in the central Cuzco Valley. Archaeological and historical data attest to the ways in which Inka modifications of the environment constrained colonial landscape transformations, even as the appropriation of Inka landscape projects by colonial landowners gave impetus to processes of enduring social and ecological change.

- Stafford, C. (Indiana State University) and Tiffany Grossman (Indiana State University)**

[206] Community Patterning at an Allison-LaMotte Village in the Lower Wabash Valley

Based on survey data Winters indicated that LaMotte sites are commonly characterized by a C-shaped house/ midden distribution with a central plaza. Pace and Apfelstadt, however, did not find this spatial pattern at the Daugherty-Monroe site in Sullivan County. Geophysical survey and test excavations at the Northwood site, an Allison-LaMotte village in the lower Wabash, have focused on community structure. A fluxgate gradiometer survey identified over 186 magnetic anomalies. Follow up testing with hand excavated units of a sample of these anomalies of different magnetic strength verified that most represent large deep storage-like pits. A quiet area, however, was also identified in the gradiometer survey. Differential artifact densities and geochemical data indicate a central plaza surrounded by a heavily occupied residential zone. Implications for this community pattern are examined and recent radiocarbon dating is also presented.

Stahl, Peter (University of Victoria)

[26] Mammalian Archaeofaunal Accumulations at the Las Vegas site and Early Human/Animal Relationships in Southwestern Ecuador

Analysis and interpretation of a large mammalian archaeofaunal assemblage associated with Early to Middle Holocene Las Vegas occupations in Santa Elena Province, Ecuador, suggest alternate modes of accumulation for different animal taxa recovered in archaeological excavations at the habitation and ceremonial site of Las Vegas. Contextual analysis of preserved bone specimens from smaller animals is suggestive of primarily non-human accumulation, whereas the patterned survivorship of certain larger animal specimens is suggestive of early human relationships with local faunas, particularly the endemic Sechuran fox (*Lycalopex sechurae*) which appears to have been intentionally accumulated at the site in large quantities since the beginning of the Holocene.

Stahl, Ann (University of Victoria)

[52] Discussant

Stahl, Elliot [109] see Brady, James

Stahl, Alan (Princeton University)

[211] Numismatic Evidence from Antioch for the Interaction of Europe and the East in the Crusader Period

Northern Syria was the meeting point of the Byzantine and Islamic worlds at the end of the first millennium C.E., going from 'Abbasid to Byzantine to Seljuk before the arrival of the Crusaders in 1098. An analysis of the finds of coins from the period shows the impact of European elements of monetary and visual culture on the area. This study is part of a larger re-examination of the results of the Princeton-led excavations of the 1930s by an international team of scholars, testing the potential of records and artifacts from earlier excavations to yield answers to current archaeological concerns. The author's involvement in the application of numismatic evidence to archaeological inquiry was fostered by his graduate school mentor Bernard Wailes.

Stahlman, Kathleen [29] see Kelly, John

Standen, Vivien (Universidad De Tarapaca), Bernardo Arriaza (Instituto de Alta Investigacion, Universidad de Tarapacá) and Calogero Santoro (Instituto de Alta Investigacion, Universidad de Tarapacá)

[26] A Bioarchaeological Model of Early Sedentism in Chinchorro Hunters, Fishers, and Gatherers in the North of Chile (7000-3700 B.P.)

This paper explores bioarchaeological evidence that supports the hypothesis that Chinchorro hunters, fishers and gatherers -who

inhabited the Pacific Coast of the Atacama Desert-, had a residential pattern that corresponds to early sedentism. Reduction in residential mobility among the Chinchorro is documented by the presence of stable settlements, the emergence of segregated burial areas from the domestic space, the formation of large middens and the development of a highly specialized technology for the exploitation of marine resources. Our analysis of the bioarchaeological evidence also supports this hypothesis and includes: (a) highly complex mortuary practices, (b) high frequency of specific and non-specific infectious diseases (e.g. treponematosis and periostitis respectively), (c) high frequency of trauma due to interpersonal violence, (d) a high frequency of parasitic infestation and (e) high frequency of pediculosis (ectoparasitism). The presence of these bioarchaeological markers is indicative of a nucleation and crowding of human groups, closely related with a sedentary lifestyle. Sedentism, however, does not exclude logistics mobility to nearby oases and Andean valleys as a strategy to complement economic resources, and along the coast, to establish social relationships with groups in neighboring valleys, in order to obtain and exchange women or to celebrate rituals.

Standen, Vivien [272] see Arriaza, Bernardo

Standing Rock, Duncan [262] see Bello, Charles

Standing Rock Sr., Duncan [265] see Windy Boy, Alvin

Staniforth, Mark (Monash University)

[95] Maritime Trade in South East Asia before 1500 A.D.: The Underwater Evidence

Colonialism, colonization and the expansion of European powers into the New World, Africa and the Indo-Pacific after A.D. 1500 has been identified as one of the central areas of interest in historical archaeology. To date far less emphasis has been placed on the historical processes associated with colonialism in South East Asia before the arrival of the Europeans around A.D. 1500. Clearly there was widespread seaborne trade throughout the region and underwater archaeology is beginning to reveal some of the extent and nature of that trade. Archaeological evidence in the form of material culture in this context assumes a greater importance in light of the relative paucity of available written sources. This paper will apply an Annales School theoretical framework to the underwater evidence of trade in South East Asia to illuminate wider issues from specific cases. While shipwreck archaeology can be largely seen as "the archaeology of the event" these individual events can be used to build a picture of longer term, and larger scale, historical processes and systems at work in the region.

Stanish, Charles (Cotsen Institute, UCLA) and Henry Tantaleán

[214] Recent Research on the Paracas and Carmen Occupations of the Chincha Valley

This paper reports on new research from the valley of Chincha that focused on the Paracas and Carmen occupations. The theoretical basis of this work centers on understanding the processes of state formation during the EIP of this region. In particular, we focused on the emergence of a Paracas/Carmen settlement complex in the upper valley, first described by Wallace and later Canziani. One of these in particular, a pyramidal site known as Cerro del Gentil, was excavated and mapped. Data indicate that the pyramid was built in Paracas times and continued into a later Carmen occupation. We also discovered numerous geoglyphs in the pampa Carmen that were aligned with several Paracas/Carmen centers in this part of the Chincha valley. This paper presents a summary of these data and offers some insight into the nature of the Paracas and Nasca-contemporary Carmen occupations in the Chincha valley.

Stanish, Charles [235] see Griffin, Laura

Stanley, Benjamin [273] see Dennehy, Timothy

Starbuck, David

[261] *British Forts in Northern New York State*
 Numerous British fortifications were constructed in the 1750s along Lake Champlain, Lake George and the Hudson River along the eastern edge of the colony of New York, and many of these positions were reoccupied later during the American Revolution. Strategically-positioned forts were accompanied by large seasonal encampments, by specialized structures that included blockhouses and hospitals, and by battlefields where clashes occurred among the British, French and their Native American allies. The author has conducted excavations for over twenty years at several of these forts and encampments, seeking to understand the strategies, provisioning, and building techniques employed by British Regulars as they fought on the American landscape. These sites include Fort William Henry, Fort Edward and Rogers Island, each of which helped to open up the interior of New York to further settlement.

Stark, Barbara (Arizona State Univ)

[133] *Economic Growth in Mesoamerica*
 Economic growth is uncommonly examined for the ancient world, despite its prevalence as a topic of concern in modern economies. The modern concept is debated and measures vary, with many of them inaccessible for the ancient world, such as gross domestic product. Even with abundant documentary information, such as for ancient Rome, inferences are challenging. For Mesoamerica the subject is highly scale sensitive and entangled with political systems, but some possible indicators can be considered. Despite the difficulties of the subject matter, archaeological studies of economic change at multiple scales (geographic and temporal) can benefit from a perspective that inquires about economic growth, even if firm conclusions remain elusive. Issues of economic growth demand attention to regional and inter-regional scales, political change, household studies, economic systems, and bioarchaeological examination of health and demography. Three subjects addressed here are expansionary growth in which production and distribution of products increase, agricultural intensification, and demographic expansion that underwrites augmented production and consumption. The position adopted is that economic growth is largely episodic or unstable, but nevertheless exhibits some cumulative effects in Mesoamerica prior to the Spanish conquest.

[63] *Discussant*

Stark, Miriam, Rachna Chhay (Department of Monuments, Archaeological Unit, Depa), Piphal Heng (Dept of Anthropology U of HI) and Alison Carter (Dept of Anthropology U of WI)

[104] *Angkorian Settlement: A View from the Center*

Archaeologists working on the Angkorian period have access to a range of documentary resources, including Chinese accounts and inscribed stelae from temples across the 1000 km² area that is the Greater Angkor region. A large corpus of archaeological research, begun in 1909 with Jean Commaille's restoration work at Angkor Wat, is also available. Collectively, these sources offer rich insights on Angkorian economy, religion, and political administration. However, despite decades of field-based archaeological activity in the Angkor region, little attention has concentrated on residential patterning in the Khmer Empire's urban core.

In this paper we discuss preliminary results from 2010 and 2012 fieldwork through the Greater Angkor Project. Our research at three Angkorian-period sites (the enclosures of Angkor Wat and Ta Prohm, and the habitation/industrial site of Kok Phnov), coupled with our review of other recent work in the region, offers new perspectives on site function and use. We compare archaeological patterning with reconstructions using contemporaneous documentary sources and discuss avenues for future research.

Stark, Miriam [190] see Ikehara-Quebral, Rona

Starke, Chelsea [94] see Hoffman, Brian

Steelhardt, Stéphanie, Dominique Marguerie (Laboratoire Archéosciences, UMR 6566 CReAAH, Unive), Najat Bhiry (Département de géographie, Université Laval, Pavil) and Pierre Desrosiers (Institut culturel Avataq, 360-4150 rue Ste Catherine)

[137] *Identification and Analysis of Charcoals and Woods Found in Paleo and Neo-Eskimos Archaeological Sites in the West Coast of Nunavik (Low-Arctic of Quebec, Canada)*

Wood resources have had a special importance in the daily life of Paleo and Neo-Eskimos populations who used it for heating, making tools or transportation. This study presents the anthropological and xylological results of charcoals and woods found in archaeological sites located on the east shore of the Hudson Bay in Nunavik (northern Quebec, Canada) : Kcfs-2 and KdFr-3 in the vicinity of Ivujivik in the grass tundra, IbGk-3 near Inukjuak in the shrub tundra, and HaGd-4,7,23,30 near Umiujaq in the forest tundra. On 556 pieces sampled from these sites, 57% are identified as spruces "Picea sp", 6% larches "Larix sp" and 20% "Picea sp or Larix sp". Some hardwoods as willows "Salix sp" (4%) and birches "Betula sp" (1%) and others plants "Erica sp" (9%) have also been found. Moreover, the presence of pines "Pinus sp" (2%) and chestnuts "Castanea sp" (<1%) found in Kcfs-2 archaeological site and hemlocks "Tsuga sp" (1%) in IbGk-3 archaeological site, proves that people used driftwood in these two sites. Finally, the finding of these fossil species gives some hypothesis about their origin in these areas of sub-arctic.

Steele, James [215] see Silva, Fabio

Steele, James (University College London)

[291] *Dates and Dispersals: Comparing Observed and Modeled Spatial Demographic Trends with Noisy Datasets*

We shall revisit the use of radiocarbon dates for testing models of the peopling of the Americas, and ask how forward models can be used to generate predictions that can be evaluated against the archaeological records of arrival times and of cumulative occupancy at different spatial locations. We will evaluate alternative statistical methods of pattern recognition in both these dimensions of the radiocarbon record, and investigate the basis of the problems typically encountered when interpreting such patterns in the presence both of uncertainty and of systematic error.

Steen-McIntyre, Virginia (geologist, tephrochronologist)

[169] *El Horro: A Mid-Pleistocene Mastodon Butcher Site from the Valsequillo Reservoir Area, Puebla, Mexico*

In 1962 archaeologists C. Irwin-Williams and J. Armenta Camacho found four sites on the north shore of the Valsequillo reservoir, Puebla, Mexico, with in situ bones of extinct Pleistocene

vertebrates, some with butcher marks, and stone tools. Roughly 250-400ky, Hueyatlaco (2056 m), the highest and youngest site, has been reported in the literature. El Horro (2040 m), the lowest site, had edge-retouched, unifacial tools laying in/on flat-lying Amomoloc lake beds dated to 280ky, using U-series methods (butchered mastodon tooth fragment). It was exposed only in 1962, when the water in the reservoir was very low. The distinctive Xalnene tuff capped (was younger than) the Amomoloc lake bed that was dated to 1.3my using reverse polarity. Could El Horro be older? There needs to be more field work in the area.

Steeves, Paulette (Binghamton University)

[169] *Rebuilding Bridges to the Indigenous Past*
This research addresses issues which are discussed as being critical to the healing, health and well being of Indigenous communities, including destructive historic events at the heart of a lingering intergenerational trauma. This work opens a discourse on an area neglected in American archaeology, the impacts of colonial academic knowledge production. Multidisciplinary data suggests that Indigenous peoples have been in the Western Hemisphere for over 50,000 years. However many American archaeologists discuss the Indigenous people of the Western Hemisphere as recent migrants from Asia. Historically archaeological sites that claimed to pre-date 11,200 YBP were assumed to be controversial and excluded from serious scholarly consideration. I argue that boundaries of time for migrations to the Western Hemisphere remain political constructs of neocolonial power and control over Indigenous heritage, material remains, and history. I discuss a new data base listing over 600 pre-11,200 YBP sites in the Western Hemisphere that supports an earlier time frame for initial habitations. This research rebuilds bridges to the Indigenous past that North American archaeology historically burned in political fires of power and control. This study re-links Indigenous peoples to their ancestral places, landscapes, and times, through studies of Pleistocene archaeology sites, the ancestor's paths.

[169] *Chair*

Steffen, Anastasia [85] see Kulischeck, Jeremy

Steffen, Martina (Royal BC Museum)

[243] *A Late Pleistocene Association of *Arctodus simus* and *Ursus Arctos* from Pellucidar Cave on Vancouver Island Including DNA Analyses*
New mitochondrial DNA analyses on three Ursus arctos post-cranial bones from Pellucidar Cave in southwest Canada show that the ancestors of these brown bears migrated south from eastern Beringia to the contiguous United States by way of an interior route before the Last Glacial Maximum. Radiocarbon age estimates on the bones indicate that brown bears lived at the fossil locality 11,100 and 12,400 radiocarbon years ago. These brown bears were found in the same cave as Arctodus simus that date to approximately 11,700 radiocarbon years ago. These data provide an additional account of the Pleistocene distribution of brown bears in North America and the association of brown bears with Arctodus simus, a potential competitor. Our findings add to the biogeographic setting within which early human occupation in the Americas took place.

Stein, Julie (University of Washington)

[168] *Discussant*

Stelle, Lenville (Illinois State Archaeological Survey)

[18] *Chair*

Stemp, William (Keene State College), Tonya Coffey (Appalachian State University), Adrian Evans (University of Bradford), Harry Lerner (Postdoctoral Fellow, Laval University) and Danielle MacDonald (University of Toronto) [98]

An Assessment of Multiple Surface Measurement Systems: Documenting Use-Wear on Experimental Mistassini Quartzite Scrapers

Over the past decade or so, there has been growing interest in the quantification of lithic use-wear using measurement systems primarily developed by engineers for a variety of research and commercial applications. Because these systems are highly tested to meet industrial standards, they provide significant research opportunities to archaeologists by providing results that are both reliable and reproducible. In this paper, we discuss the use of three different measurement systems – the atomic force microscope, the laser scanning confocal microscope, and the focus variation microscope – in terms of their ability to measure the used and unused surfaces of four scrapers made from Mistassini quartzite. These tools were used in experiments to scrape fresh and dry deer hide. In addition to discussing the strengths and weaknesses of each of these measurement systems to record surface wear on quartzite tools, some preliminary observations regarding future comparisons between the surface data produced by the three different systems are provided.

Stenholm, Nancy [224] see Truman, Elizabeth

Stephen, Jesse (JPAC-CIL) and Hugh Tuller (JPAC-CIL)

[251] *Atypical Effects of Aircraft Crashes and Bomb Explosions on the Succession of Archaeological Contexts: Three Case Studies from WWII and Vietnam*

A primary purpose of excavation in archaeology is to develop an understanding of a site's stratigraphic relationships (layers and layering) and the context(s) of its extant material culture. Achieving such an understanding is critical not only for the fullest recovery of artifacts, but also for their accurate interpretation. Archaeological stratigraphy is typically studied by applying a set of laws or principles, including superposition, original horizontal, continuity, and stratigraphic succession to the record observed (Harris et al. 1993). In this paper we review three cases that incorporate atypical effects of airplane crashes and bomb explosions on stratigraphic relationships within the landscapes of two major wars, and explore unique challenges faced in the processing of such sites for the recovery and identification of missing service members. In specific, we review aircraft crash and bomb blast soil disturbances and mixing, the related distributions of incident-related materials, and approaches practiced by JPAC anthropologists to mitigate these complexities while furthering the application of archaeological techniques, methods, and laws to sites that are host to a notably wide range of archaeological site formation processes.

Stephenson, Birgitta (University of Queensland)

[155] *The Clarity of Staining: The Application of Biochemical Staining to Differentiate Archaeological Residues*

Integrated use-wear and residue analysis studies are frequently utilized to investigate tools to derive functional interpretations relating to subsistence, settlement and technical activities of past populations. A major strength of this approach is that functional assessments are determined independent of form and associated typological assumptions. Its reliability, however, is dependent on the accuracy of the analysts to reliably identify microscopic residues. Lombard and Wadley (2007:155) have highlighted interpretative issues associated with the morphological similarities of some faunal and plant residues. Additionally residues may become unidentifiable when their microscopic diagnostic features have been damaged by activities such as cooking and drying or by

the mechanical forces associated with pounding and grinding (Babot 2003).

As such a need for an additional identification method which is not largely dependent on the visualization of microscopic diagnostic features is highlighted. In particular, the unequivocal identification of animal residues regardless of any associated processing activities is essential for achieving unambiguous functional understandings. This paper reports on the development, adaptation and application of a biochemical staining protocol designed to highlight animal specific residues within archaeological contexts. In particular its application for identifying ground residues associated with grindstones, grinding hollows and grinding patches is demonstrated.

Stern, Charles R. [26] see Martin, Fabiana María

Stern, Charles (University of Colorado)

[279] *Obsidian Sources and Long-Distance Transport in Southern Patagonia*

Based on their scarcity (<1% of all artifacts), relatively small size, and evidence for reworking, J Bird correctly suggested that obsidian artifacts in Pali-Aike and Fell's caves (~52°S), southernmost Patagonia, were derived from distant sources. Three different color obsidians occur in these sites. The source for black obsidian (50% of the obsidian artifacts) is Pampa del Asador (~47°S; geologic age of 4.9 to 6.4 Ma) 500km to the northwest, for banded grey-green obsidian Cordillera Baguales (~50°S; 2.3 Ma) 250km to the northwest, and for green obsidian near Seno Otway (~53°S; 17.1 Ma) 200km to the southwest. Black obsidian from Pampa del Asador occurs in Patagonian sites as old as >10,500 radiocarbon years B.P., from Tierra del Fuego in the south to northeast along the Atlantic coast near Puerto Madryn (~42°S), where it mixes with two other obsidians derived from Sacanana and east of Telson (both near 42°S; 17.8 and 14.6 Ma, respectively). Obsidian from the active Chaitén volcano (~44°S) in the Andean cordillera occurs in maritime cultural sites 400km to both the north and south along the Pacific coast, and three pieces have recently been found near Pali-Aike cave, implying transport of >1200km through the Strait of Magellan.

Stevens, Nathan [12] see Fitzgerald, Richard

Stewart, Brian

[76] *Aptitude at Altitude: Flexibility as "Modernity" in Later Pleistocene Highland Lesotho*

The highlands of eastern Lesotho preserve a highly atypical record of later Pleistocene Africans living in and adapting to a rugged, deeply dissected montane landscape. A dense network of river-valley, plateau and upland open-air later Pleistocene finds surround and connect a series of collapsed and intact sandstone rockshelters, some with stratified sequences stretching back over 80 ka. Recently renewed investigations at one of the latter, Melikane Rockshelter (1800 m a.s.l.), have revealed a culturally rich if taphonomically complex sequence with pulsed human occupations at ~80 ka, ~60 ka, ~50 ka, ~46-38 ka, ~24 ka and several spanning the Holocene. This paper presents the results of paleoenvironmental and lithic technological analyses on material from the conspicuous occupational pulse between ~46 and 38 ka. Consistent with proxy indicators from further field, a range of paleoenvironmental evidence from Melikane suggest a shift occurred in regional climate during this interval, when recurring sharp arid and cool phases preceded the buildup to Last Glacial Maximum. This instability coincides with successive, apparently rapid changes in Melikane's stone tool assemblages across this interval. It is suggested that afromontane foragers reconfigured their subsistence-settlement routines and perhaps sociocultural networks as flexible adjustments to the newfound volatility of highland living.

[76]

Chair

Stewart, Brian [76] see Dewar, Genevieve

Stewart, Haeden (University of Chicago) and Ian Ostericher (University of Washington)

[121] *The Different Strategies and Stages of "The Crossing": Mapping the Assemblages of Migrant Sites in Relation to Their Distance from the Arizona/Sonora Border*

Every year, hundreds of thousands of undocumented migrants make the potentially deadly three-to-ten day hike across the Sonoran Desert to enter the U.S. without authorization. As they move further from the border people employ different methods to deal with obstacles created by the desert and Border Patrol surveillance, mediating these strategies with materials that they have brought with them or found along the way. These strategies may be as simple as discarding an empty water bottle to something as complex as building a shelter for shade. Material traces left in the desert by the migrants reflect the decisions and strategies made at different points in their journey. Drawing on spatial and artifact data collected by the Undocumented Migration Project since 2009, I analyzed migrant sites found at different distances from the border and in a variety of geographic locales (e.g., ravines, hill-tops). In this poster I argue that "border crossings" are composed of a series of strategies and stages that have clear archaeological correlates and I discuss the ethical dilemmas associated with conducting a spatial analysis focused on a clandestine and illegal activity.

Stich, Kyle (Louisiana State University)

[236] *The Paleoethnobotany of Incipient Urbanism at Caylán*

The site of Caylán (800-1 BCE) is a Formative Period urban settlement located on the north-central coast of Peru. Recent Louisiana State University excavations at Caylán collected a series of soil samples from features and floor contexts. These samples were fine-screened to 0.5 mm and visually scanned for botanical and faunal remains using incident light stereomicroscopy. This analysis offers insights into the utilization of space and human-environmental interaction within a context of incipient urbanism. The data recovered from these samples provides evidence for Caylán as a permanently occupied settlement with a mixed subsistence base underpinned by trade.

Stimpson, Christopher (McDonald Institute for Archaeological Research, University of Cambridge)

[35] *Birds and People in a "Biodiversity Hotspot": A 50,000-Year Zooarchaeological Perspective from the Great Cave of Niah, Sarawak*

Analyses of Quaternary-age bone assemblages can provide long timescale insights into the ecology of extant vertebrate taxa and provide historical benchmark data for biological conservation. This presentation reports results from an analysis of bird bones that were recovered during archaeological excavations of a cave site in a biologically diverse lowland rainforest setting in North-Western Borneo.

Since the late 19th century, the Great Cave of Niah in Sarawak, Malaysian Borneo has been one of the most intensively studied archaeological sites in Southeast Asia. The archaeological sequences date from ~ 50 ky B.P. to 0.35 ky B.P. and have yielded the earliest direct evidence of the presence of anatomically modern humans in Borneo in the late Pleistocene, dated to 40-44 ky B.P. Until recently, however, the bird bone assemblages that were recovered from the site have received little attention. The taphonomic challenges faced by a dedicated study are discussed and the insights that the bird bone assemblages provide into the landscapes, people and avian biodiversity of the Niah area in the past are described. The intrinsic value of zooarchaeological

data as long-term records of biodiversity and as a means to contextualise human impact in the present is highlighted.

Stirn, Matthew (University of Sheffield)

- [75] *Considering High Altitudes within the Numic Spread*
 The high mountains exist as an intricate and paradoxical landscape within the context of the Numic debate. The significance of the alpine ecotone has remained unequivocal yet the importance of this environment to late-prehistoric Numic speakers has undulated greatly between researchers. Landscape adaptation models centered in the Western fringe of the Numic territory have commonly portrayed high altitudes as marginal environments that were occupied intensively late in prehistory. Alternatively, research performed to the East in Wyoming's Wind River Range interprets the alpine ecotone as economically rich and developmentally significant in early Numic chronology. This paper marks an attempt to explore mountains as an archaeological landscape within the Numic sphere, investigate the varied ranges of interpretation they have received by archaeologists, and finally to discuss the implications recent work performed in the Wind River Range bears upon the conversation.

Stock, David [40] see Laak, Emily

Stokes, Robert (Archaeological Consulting Services)

- [175] *The Role of Landless Families in the Creation of New Communities in the Mimbres Area*
 This paper focuses on community formation in the Mimbres River Valley of Southwestern New Mexico and the role that landless families played in this process. It has been noted since the 1970s that the Mimbres people used the resources of side drainages and built habitation sites there, although they were often thought to be short term for use during the agricultural cycle (i.e., supplemental farming strategies) or for natural resource procurement trips. However, reexamination of large-scale survey data for the Mimbres River and its side drainages revealed a community system pattern in both areas where a single large pueblo was surrounded by a variety of smaller sized pueblos and field houses, with "empty" areas in between. Based on insights from a review of ethnohistorical examples and sociocultural/environmental factors, I argue that as the Pueblo period population quickly rose, the best farmlands were already claimed by long-resident families, forcing those without access to good lands to make decisions for their survival, including moving into unclaimed marginal areas. Here, the "landless" recreated the community and sociocultural systems of the main valley. Therefore, this research presents an example of the power of household-level decision making regarding the formation and maintenance of communities.

[175] *Chair*

Stone, Jessica [2] see Poteate, Aaron

Stone, Suzanne (HDR) and Jarrod Burks (Ohio Valley Archaeology, Inc.)

- [34] *Fort Brown: What Lies Below?*
 Fort Brown, listed on the National Register of Historic Places and a National Historic Landmark, was the starting point of the Mexican-American War in 1846. Located in Brownsville, TX, this earthen fort was constructed by U.S. Army troops. The fort saw combat while still under construction and was instrumental in the earliest battles of the war. After the establishment of a newer fort immediately to the north, the earthworks were essentially abandoned. Development and levee construction have obscured much of the fort's footprint and only a few denuded surface mounds give a clue as to its original location. There have been no systematic excavations at the fort and, until 2011, only an initial ground penetrating radar feasibility study had been completed. As

part of the NPS's geophysics workshop for archaeologists, an initial geophysical study was conducted on part of the fort in May 2011. Using the NPS results as a springboard, in September 2011 HDR and OVAI conducted a further geophysical study of the suspected earthwork's footprint to support CBP's environmental and historical resources stewardship efforts. The results of the geophysical data indicate that large parts of the earthwork remain intact, especially the southern half, despite major surface disturbance.

Stone, Jessica (University of Oregon), Scott Burnett (Eckerd College), Scott Fitzpatrick (University of Oregon) and Abby Heller (Eckerd College)

- [37] *Dental Pathology of Late Ceramic Age Inhabitants on the Island of Carriacou, West Indies*
 Dental pathology provides important insights on subsistence patterns, oral health, and the behavior of past populations. This presentation explores various dental data, including rates of caries, attrition, antemortem tooth loss, linear enamel hypoplasia (LEH), and antemortem dental chipping among prehistoric individuals from the island of Carriacou in the southern Caribbean dating to the Late Ceramic Age (ca. AD 1000-1400). Contrary to expectations, prehistoric inhabitants of Carriacou exhibited higher caries and LEH frequencies compared to other sites in the Caribbean, despite regional similarities in diet. Overall, our results suggest that manioc was likely a dietary staple, which is further supported by the occurrence of lingual surface attrition of the maxillary anterior teeth (LSAMAT), a wear pattern commonly associated with processing manioc. Additional non-masticatory use of the dentition may be evident in patterns of antemortem dental chipping, where slight sex-related differences were noted and could be the result of male fishing-related activities. Results show no significant differences between sex, age, and prevalence of LEH in the sample (n=21). However, the majority of hypoplastic events occurred between two and four years of age, suggesting that weaning may have been a factor.

Stone, Pamela (Hampshire College), Ryan Harrod (University of Nevada Las Vegas) and Debra Martin (University of Nevada Las Vegas)

- [286] *Strong Women and Tired Men: A Bioarchaeological Analysis of the Role of Women in the Ancestral Pueblo World (A.D. 800-1300)*

Social roles defined by sex and gender are aspects of community life that highlight the ways different groups organize labor and other aspects of daily life. This project focuses on female and male social roles in Pueblo groups from the U.S. Southwest (A.D. 800-1425). Archaeological reconstruction and bioarchaeological analyses were conducted using data from a number of archaeological sites. There has been a tendency to focus on the differential cost of reproductive stress on reproductive-aged females, but our data do not support this. While females may have had to balance the costs associated with birthing and raising children, age-matched males had their own biological burdens. For example, analysis of nutritional anemia and measures of robusticity and stature revealed some counterintuitive findings. Males suffered from anemia and females often exceeded male robusticity, hence we found evidence for tired men and strong women. Ethnographic data suggests that the political-economic system of these cultures was matrilineal giving women access to a higher degree of power and autonomy. The agency afforded to women in these societies demonstrates that when age-matched male and female indicators of stress are compared, the cultural context is crucial for interpreting their meaning.

Stoner, Wesley [136] see Rodriguez, Enrique

Stoner, Wesley (University of Missouri Research Reactor)

- [288] *Revisiting Classic Period Economic*

Development in the Tuxtla Mountains, Southern Veracruz, Mexico

Around A.D. 300, a group using ceramic and architectural forms associated with the Central Mexican city of Teotihuacan founded the Classic period site of Matacapan in the Tuxtla Mountains of Southern Veracruz, Mexico. In the 1980s, discovery of Classic period ceramic kilns at Matacapan sparked research that incorporated mineralogical and chemical analysis of ceramic products and which showed ceramic production and exchange was a key factor in the economic development of the site. This paper reviews three decades of multi-technique compositional characterization of clays and ceramics in the region to investigate patterns of ceramic production and exchange. We compare the production-distribution system centered at Matacapan with its contemporaries to evaluate how and to what degree engagement with Teotihuacan may have influenced economic development in the Tuxtlas. PE, NAA, LA-ICP-MS, XRF.

[288] *Chair*

Stoner , Wesley [288] see Jorgensen, Mia

Storey, Alice (University of New England)

[35] *Nest Eggs: The Importance of Chickens to Pacific Island Economies and Cultures Past and Present*

The archaeological record clearly demonstrates that the chicken was a companion aboard many Pacific canoes in prehistory. Chicken bones from Pacific archaeological sites have been used to understand the migrations and interactions of humans through studies of their isotopes, mtDNA, and their age. But there is so much more to the story of the Pacific chicken than is told by molecular archaeology. Chickens were moved by people because they were important to people and the role of these domestic birds in ancient lives is also important to telling the story of the human past. Through a discussion of the archaeological, ethnographic, and historical records I will attempt to reconstruct some aspects of human interactions with domestic chickens in the Pacific and discuss future lines of evidence that may tell us even more.

Storey, Rebecca (University of Houston) and Lourdes Marquez Morfin (Escuela Nacional de Anthropologia e Historia)

[46] *Status and Health among Artisans of Teotihuacan, Mexico*

Like other preindustrial cities, Classic-period Teotihuacan had resident full-time craft specialists. Skeletal samples have been studied for age, sex, and paleopathological health indicators from a lapidary compound near the center of the city (La Ventilla) and from a compound with both lapidary and ceramic production in a peripheral neighborhood (Tlajinga 33). The more central compound was part of a more prestigious neighborhood. These two samples should be quite similar, but the prevalence of paleopathological indicators differs. How much is caused by different urban environments and how this was influenced by social status is the question to investigate. Tlajinga 33 has higher prevalence of indicators than La Ventilla, an indication of high burden of morbidity but also survivorship. A detailed investigation by age and sex reveals that La Ventilla, for all its advantages, had more frail children. Individuals surviving into adulthood are more similar in both apartment compounds. The peripheral location of Tlajinga 33 seems to have caused its inhabitants a high morbidity burden. Social status at Teotihuacan had a varying effect on the health.

Storli, Renate [83] see Tankosic, Zarko

Stosel, Victoria (University of Alaska, Fairbanks)**[217]***An Examination of Shellfish Utilization on San Nicolas Island, California*

This paper focuses on the diet, subsistence strategies and predation habits of the indigenous San Nicolas Island population. Due to San Nicolas Island's position within the Santa Barbara Channel, a region home to thousands of marine species, the population developed a marine adaptation. Shellfish utilization is the specific focus of this analysis. Researchers have demonstrated the ability of individuals to secure their daily recommended allowance of protein (DAR) by foraging for shellfish. Theories such as optimal foraging and human behavioral ecology attempt to discern why a population favors certain resources by ranking them based on factors such as nutrition, procurement costs and densities, favoring larger species such as abalone and California mussel. While these theories offer a framework for examining a population's foraging choices, smaller species such as turbans and sea urchins often receive lower ranks based on their low nutritional return. Their low ranking belies the quantities in which the San Nicolas Island population utilized these species.

Stotts, Rhian [207] see Snitker, Grant

Stovel, Emily (IIAM-UCN and Ripon College)

[132] *Data Counterpoint: Comparing Chemical Profiles of Tiwanaku Vessels*

The special role of Tiwanaku ceramic vessels in Middle Period graves in San Pedro de Atacama is marked by their low quantities compared with other nonlocal ceramics and other Tiwanaku objects. This is particularly interesting when one thinks of the important role ceramics played in Tiwanaku ritual and in the exploration of Tiwanaku social structure and regional influence in modern archaeology. Of course, it is possible that non-colonial relationships did not warrant large scale importation of Tiwanaku vessels, so what of the local variants with some Tiwanaku characteristics? The present paper explores variation in ritual Tiwanaku ceramic artifacts throughout the Andes and in San Pedro by drawing on comparative pXRF data from a wide range of objects found in North and South American museums. These chemical profiles will be presented along with the results of chemical characterization of white pigment found on fineware vessels as part of exploring what kinds of Tiwanaku vessels were buried in San Pedro graves and how this can help us think more about their role in mortuary ritual during the Middle Period (A.D. 500-1000).

Stovel, Emily [253] see Deibel, Michael

Strachan, Scotty [87] see Villagran, Victor

Straus, Lawrence [220] see Fontes, Lisa

Strawhacker, Colleen (Arizona State University)

[89] *Modeling the Ecological Risk of Prehistoric Landscapes in the Southwestern United States*

Through the Long-Term Vulnerability and Transformation Project, our research explores the relationship between ecological and social diversity and how these measures of diversity relate to vulnerability to food shortfall in our archaeological case studies. One piece of understanding the vulnerability to failing to produce enough food is defining the risk factors that may limit crop production on a given landscape. Multiple complex socioecological variables need to be considered when defining how prehistoric communities in the Southwestern United States mediated this risk. Focusing on two case studies – the Zuni and Salinas regions in New Mexico - this poster will present how to model the ecological

variables that may limit crop production in different areas of the Southwest. Using large spatial archaeological, historical, and ecological datasets in a GIS database, ecological risk factors are mapped and defined for each case study to understand how often different patches of the landscape may fail to produce crops across space and time. By creating this ecological "risk landscape," we can then begin to address the social strategies, such as storage or reliance on social networks, which were employed across the Southwest when faced with food shortfall.

[89] *Chair*

Stretton, Sean and Matthew Curtis (University of California Santa Barbara and College)

[208] *GIS Applications and Landscape Archaeology in the Gamo Boroda Highlands of Southwestern Ethiopia*

The purpose of this project is to take a landscape archaeology approach to help understand patterns of site location and use in the Gamo Boroda Highlands of Southwestern Ethiopia. This poster presents data collected as part of an ongoing ethnoarchaeological and paleoenvironmental research project in the region that includes archaeological and historical site locations ranging from the Middle Holocene to the modern era (c. 6,000 BP to 100 BP). Geographical Information Systems (GIS) software such as Environmental Systems Research Institute's (ESRI) ARCMAP and ARCScene were used to display and render the collected data.

Strezewski, Michael

[178] *Redware Pottery Production in New Harmony, Indiana: 1815-1824*

The Harmonists were a millennial and utopian religious group founded in Germany in the late eighteenth century. They settled in southwestern Indiana in 1814 and constructed a town, New Harmony, on the Wabash River. One of the many items they manufactured was redware pottery. Despite the presence of dozens of redware potters in the pioneer-era Midwest, there have been few investigations of redware production sites. Excavations at the Harmonist kiln have provided abundant evidence for Harmonist redware manufacture, and, coupled with contemporary documents, have generated a more complete picture of the pottery operation than is available in most contexts.

[178] *Chair*

Striker, Sarah (Arizona State University)

[6] *The Mantle Site: Community and Non-Local Contacts*

The Mantle site is an early sixteenth century Northern Iroquoian settlement on the north shore of Lake Ontario. It was created by the coalescence of several smaller communities to form a single, well-planned settlement. The Mantle site was completely excavated between 2003 and 2005, unearthing a near-complete village plan, more than 150,000 artifacts, and more than 95 structures. Preliminary analysis of diagnostic ceramic and stone artifacts suggests a greater diversity of external community contacts than observed at local sites that predate Mantle. It has been unclear whether these external contacts are homogeneous among Mantle residents, or if there is differential access to certain objects among residents with differing social ties. This study examines the spatial distribution of diagnostic pottery, smoking pipes, and stone artifacts whose materials or decorative styles suggest a non-local origin or influence. GRASS GIS is used to map object distributions to determine to what degree specific diagnostic objects were limited to particular households, feature types, or disposal areas. Results are presented for both early and late site occupation phases to elucidate temporal trends. This research provides a measure of variation in extra-community contacts among Mantle residents for different periods of occupational history.

Stringer, Chris (Natural History Museum London)

[215] *Discussant*

Stroulia, Anna (University of Southern Indiana) and Laure Dubreuil (Trent University)

[83] *Design or Use? Discussion of a Peculiar Shape among Grinding Tools from Kremasti-Kilada, Northern Greece*

The Late Neolithic site of Kremasti-Kilada, in northern Greece, yielded a substantial number of the passive and active grinding tools that Old World archaeologists often call millstones and handstones respectively. Systematic study of the material has revealed that the work faces of several of these tools exhibit an unexpected shape, as they are concave along the long axis but convex along the width. Kremasti-Kilada is not the only site with grinding tools of such a work face configuration; a survey of the literature has identified similar specimens in a few other European assemblages. Some ground stone specialists have interpreted this configuration as a result of manufacture, others as a byproduct of use. In this paper, we will review these interpretations and we will argue that at Kremasti-Kilada millstone and handstone work faces were originally manufactured as flat along both axes, but became concave along the length and convex along the width after a period of combined use in a certain kinetic mode.

Stuart, David [21] see Aveni, Anthony

Stuckey, Sarah and Juliet Morrow (Arkansas Archeological Survey)

[142] *Sourcing Burlington Formation Chert: Implications for Long-Distance Procurement and Exchange*

Lithic material is ubiquitous in the archaeological record and it is often the only material recovered from archaeological sites dating to over 2,500 years ago in the midcontinent. The sources from which lithic materials were procured are an important key to addressing many questions, including those related to ancient mobility and exchange patterns. This paper outlines the methods that will be applied to sourcing Burlington chert from a wide range of locations in order to characterize the inter-source and intra-source variability of the chert.

Stueber, Daniel (Archaeological Investigations Northwest)

[274] *Evidence for the Use of Indirect Percussion with Stone Punches in the Manufacture of Rectangular Cross Section Type 1 Adzes During The Moa-Hunter Period of the Maori Culture in New Zealand*

Stone adzes were common in the tool kits and burial caches of ancient Polynesians. Though they appear in many forms this paper deals with the late stage of manufacture of Type 1 rectangular cross section adzes of the Moa-hunter period (1000-1400 C.E.) of the Maori culture in New Zealand. The hypothesis of this paper is that the lateral edges of these adzes, that meet to form 90° or square edges, were formed by the indirect percussion technique using punches of stone and possibly wood or other materials. Evidence for this hypothesis is based on the examination of artifacts contained in museum collections in New Zealand, Denmark, and the United States, and the results of experimental work done to replicate the artifacts.

Suarez, Rafael (Universidad de la República.)

[28] *The Peopling of Southeastern South America: Cultural Diversity, Paleoenvironmental Conditions and Organization of Lithic Technology during the Pleistocene Holocene Transition*

Recent data obtained in southeastern South America allows us to examine different topics regarding the peopling of this area of the

continent. The Fishtail point design (13,000-12,500 cal yr B.P.) is replaced in the Northwest of Uruguay and South of Brazil by the K87-Tigre point design (12,400-11,100 cal B.P.) with triangular blade, convex base and notched with very pronounced shoulders. These technological-cultural changes coincide and are probably a response to the change in paleoenvironmental parameters that occurred in the region at the beginning of the Holocene shortly before 12,400 yr B.P. The K87-Tigre points in this region are replaced by a new technological design, the Pay Paso point type (11,000-9100 cal B.P.). This presentation discusses the cultural diversity during the early peopling and the relationship to climate and paleoenvironmental changes that occurred during the Pleistocene Holocene transition.

Suda, Yoshimitsu (Center for Obsidian and Lithic Studies, Meiji University)

- [62] *Application of Internal Standard Methods to Non-destructive Analysis of Archaeological Obsidian Artifact by Wave Length-Dispersive X-Ray Fluorescence Spectrometry*

Non-destructive chemical analysis of archeological obsidian artifacts by the WDXRF was investigated, in which some internal standard methods were combined with the analysis by calibration curve method. The results indicate that internal standard method by Rh-background is preferable in calibration for irregularity of analytical sample surface and would be effective on the nondestructive chemical analysis of archeological obsidian artifacts. The Rh-background was originated from Rh-anode X-ray tube, and the intensity was measured at 29 degree of 30.00 on Rh continues X-ray. Analytical elements are limited to Calcium, Titanium, Manganese, Rubidium, Strontium, and Yttrium. Results are obtained by quantitative values. Geochemical analyses of obsidians in major producer sites revealed that results after the nondestructive analysis are generally comparable with those by the conventional low-dilution glass bead method. Moreover, obsidians in major producer sites were characterized by abundances of Ti and Sr, and by ratios of Y/Sr and Rb/Mn. These results indicate that the elements given by the nondestructive analysis are generally enough on the geochemical characterization of the obsidians, and would be directly applicable to the examination for provenance and prevalence of an archeological obsidian artifact by comparison with the geochemical database for the geological obsidian producer sites.

Sugimoto, Kassie (CSU Dominguez Hills) and Danielle Kurin (UN Jose Maria Arguedas)

- [38] *Investigating the Bio-cultural Basis of Ethnic Identity: Cranial Modification and Dental Non-metric Co-variance in Ancient Andahuaylas, Peru*

This research investigates the co-variance of biological and cultural indicators of ethnic affiliation within pre-Hispanic skeletal populations recovered from burial caves in Andahuaylas, Peru (ca. AD 700-1400). Biological groupings, determined through the analysis of inherited dental non-metric traits, are compared with cultural groupings identified by cranial modification frequency and style. If ethnicity in Andahuaylas was predicated by biological descent and also performed through practices like modification, then different head shapes should correspond to distinct biological groupings. Because dental non-metric traits are inherited, they are a good proxy for biological affinity; previous research has verified that people who are more genetically-related will share a greater number traits. Similarly, cranial modification is a permanent, prominent ascriptive anthropogenic marker whose use in ancient Andahuaylas demarcated members of the same social category. Analysis of modification patterns and 11 dental traits using k-means cluster analysis demonstrates that Andahuayan burial caves contained distinct biological populations with whose members displayed unique, corresponding head shapes. Results suggest the creation of rigid ethnic boundaries structured by biological descent and reified through permanent body

modification practices.

Sugiura, Yoko (Instituto De Investigaciones Antropologicas, UNAM), César Villalobos, M.Carmen Pérez and Elizabeth Zepeda

- [63] *Identity, Material Culture and Teotihuacan Hegemony in Toluca Valley*

Through identity individuals perceive themselves as part of a group. This, however, is not an innate quality, but is acquired through cultural processes. Identity has been fundamental for interpretation and understanding of social configurations in the past. This paper explores the processes in which, under Teotihuacan dominion, identity has played an important role in the history of Toluca Valley during the Classic period, a time of immense significance in the development of Mesoamerica. In this paper, we discuss how the population settled in Toluca Valley created strategies to negotiate at different levels of identity under Teotihuacan regime.

Sugiyama, Nawa (Harvard University)

- [228] *The Power of Sacrifice: Reconstructing the Life Histories of the Carnivores Deposited in the Moon Pyramid at Teotihuacan, Mexico*

Animals often partake in state-level ritualized activities as sacrificial victims that are important arenas for the negotiation and the reification of power structures. In these contexts, the animals sacrificed are reified into emblems of state militarism and power. For example, inside the Moon Pyramid at Teotihuacan, over one hundred of the fiercest carnivores on the landscape were found sacrificed or deposited as prepared skeletons within dedicatory chambers including wolves, eagles, pumas, jaguars and rattlesnake. This assemblage provides us with a unique opportunity to reconstruct not just the chaîne opératoire, the process of acquisition, preparation, use and deposition of each animal, but also individual life histories of the animals selected for animal sacrifice. Detailed zooarchaeological approaches are utilized to interpret the type of human-animal interactions that took place that included the physical control and manipulation of these carnivores in captivity, allowing the Teotihuacan state to manage their symbolic link with these beasts. Such an interpretation enables us to understand the meaning and function of animal sacrifice within the highly dynamic sociopolitical landscape of the arising metropolis during a period of monumental constructions at the ceremonial center.

- [228] *Chair*

Sullivan, Alan (University of Cincinnati)

- [64] *The Archaeological Study of the Archaeological Record*

At some level, we are all behavioral archaeologists – practitioners of an approach that ultimately came to dominate the research program of the University of Arizona's Archaeological Field School at Grasshopper Pueblo. Focusing on understanding how the complex interactions among formation processes affect the emergence of archaeological variability, Grasshopper research is known for its commitment to multidisciplinary studies as a means to establish a region's inferential potential for a variety of anthropological problems. My long-term project in the Grand Canyon area is modeled after the Grasshopper program, with one important exception – it does not rely on correlates, ethnography, ethnoarchaeology, or modern material-culture studies to infer the origins, formation histories, and interpretive significance of the region's highly variable archaeological phenomena. By drawing on the results of two decades of intensive survey, excavation, and geoarchaeological investigations in the Upper Basin, which is located south of the Grand Canyon's heavily visited South Rim, I illustrate how independent archaeological theory and interpretation-neutral units of analysis can yield anthropologically

interesting inferences about rarely considered forms of environmental manipulation and economic behavior, as well as the evolutionary consequences of the archaeological record itself.

Sullivan, Rachel [224] see Nanavati, William

Sullivan, Marjorie [224] see Barham, Anthony

Sumner, Daniel (James Madison University & Virginia Tech)

[206] *Conflict on the Mesa: Assessing Defensibility of Plaza-Oriented Villages in the Salinas Pueblo Province, New Mexico*

Previous archaeological investigations of plaza-oriented villages in the Salinas Pueblo Province investigated the reasons people may have aggregated in these larger towns. The threat of warfare and the need for defense is one possible explanation for the construction of plaza-oriented villages, whose layout is seemingly intended to limit access. This poster further assesses the defensibility of these sites using Geographic Information Systems (GIS). The use of a GIS approach offers an opportunity to evaluate the potential for line-of-sight communications and inter-visibility between the plaza pueblo villages on Chupadera Mesa as factors, which influenced their ability to signal allies and anticipate attack. GIS also offers an opportunity to determine the relative defensibility of the region's landforms, providing insight into the pueblo inhabitants' site selection process.

Sun, Guoping [66] see Lauer, Adam

Súnico, Alejandro [148] see Belardi, Juan

Sunseri, Jun

[221] *Run Over by the Information Super Highway in Eastern California*

When does a Native Californian community become "the public" and no longer welcome at upper-level negotiations over placement of communications infrastructure? Apparently, this can happen almost instantaneously, especially when cultural resource preservation issues are mentioned and an army of consultants have missed huge swaths of sites and landscapes that are considered critical loci of local heritage values. Recent collaboration with the Kutzadikaa Paiute of Mono Lake, California has revealed that even with a solid coalition of federally-recognized tribal authorities behind a reasonable set of expectations, globalized perceptions of need regarding modern high-speed connectivity outstrip local conceptions of heritage, patrimony, and self-determination.

Supak, Karen

[282] *Discussant*

Supernant, Kisha (University of Alberta, Department of Anthropology)

[170] *From Visualization to Analysis: Maps, Whiz-Bangs, and the Importance of GIS for the Archaeology of Shell Middens on the Northwest Coast*

Maps have long been a part of archaeological fieldwork and analysis, but with the advent of digital mapping techniques and Geographic Information Systems, maps have become even more powerful sources of data. On the Northwest Coast, scholars have applied mapping and spatial analysis in a variety of contexts, but the potential of robust GIS data from Northwest Coast archaeology has yet to be fully realized. In this paper, I discuss a set of applications of GIS data from the Prince Rupert Harbour area to demonstrate the possibilities for analysis when site-specific digital

mapping data are integrated with regional perspectives on landscape change. I highlight the importance of developing detailed surface maps of shell middens and associated intertidal zones, which, combined with subsurface exploration, provide essential data for reconstructing midden history through time in the Prince Rupert Harbour region.

Supernant, Kisha [206] see Cookson, Corey

Surette, Flannery [19] see Millaire, Jean-Francois

Suri, Miranda [264] see McFarlane, William

Susak Pitzer, Angela (University of California, Los Angeles)

[129] *Glass Recycling in Roman Egypt: pXRF Analysis of Karanis Glass*

Portable x-ray fluorescence (pXRF) spectrometry can be effectively employed to conduct quantitative chemical analysis of ancient glasses in order to identify distinct compositional groups within a closed population by considering the detection, precision, and accuracy limitations of the pXRF instrument, and through the cautious interpretation of results. Given the strict regulations of the Egyptian government prohibiting the export of archaeological material, pXRF provides the best assessment possible of the chemical composition of glass from the Greco-Roman town of Karanis, Egypt. A total of 287 colorless samples of vessel glass from recent excavations were analyzed on site using a Bruker Tracer III-V portable XRF. Three main colorless glass groups can be distinguished based on the decolorizer(s) present in the glass at levels suggesting deliberate addition: antimony-decolorized, manganese-decolorized, and mixed manganese/antimony glasses. The mixed manganese/antimony glasses may indicate a chemical composition resulting from the recycling of glass by remelting cullet to form new vessels. Diachronic changes in glass types consumed by denizens of Karanis, as well as the recycling of glass, may correlate to fluctuations in the overall economy and/or to changes in the social, ideological, and political landscape of the town.

Susan, O'Connor [224] see Barham, Anthony

Sutter, Richard (Indiana University-Purdue University Fort Wayne) and Oscar Gabriel Prieto (Yale University)

[101] *"Becoming Moche": An Examination of Competing Models of Ethnogenesis Using Archaeological and Bioarchaeological Data for the Early Intermediate Period (A.D. 200 – 750) in the Moche Valley, Perú*

The consensus among Moche scholars that Early Moche ceramics (I-II) emerged as an elite style from the co-existing Gallinazo is corroborated by both biostatistic analyses and the limited occurrence of Moche I-II ceramics in elite contexts within the Moche Valley. However, Gallinazo fine wares persist in some parts of the valley through Moche III-IV. We present biostatistic data for the Moche and other contemporaneous prehistoric skeletal samples and the results of recent excavations from the Huanchaco fishing community La Poza to examine competing models regarding how Moche fine wares played a role in transforming inhabitants of the Moche Valley to become "Moche." Our results support Billman's (2010) assertion that - with the expansion of agricultural productivity and access to water within the Moche Valley - the production and widespread distribution of Moche III-IV ceramics by elites and artisans residing at the Pyramids at Moche site were used to incorporate agrarian and fishing Gallinazo communities of the valley into Moche ethnic identity and ritual practices.

Sutton, Paula and Rita Harder (Girl Scout Troop Leader)

[265]

Indiana Girl Scouts Dig Archaeology

This poster illustrates the benefit of professional archaeologists reaching out to youth, e.g., a Girl Scout Troop. This public outreach/education project involved the archaeologist and the Troop Leader planning and implementing activities that facilitated the girls earning the Archaeology Badge. To meet badge requirements, girls participated in activities such as readings, discussions, and field trips to events during Indiana Archaeology Month. Collaborative projects such this have positive outcomes. Youth receive a badge and gain greater knowledge and appreciation of anthropology/archaeology/prehistory/protohistory/history/environment. The Troop Leader engages her scouts in worthwhile activities. The archaeologist who is a First Class Girl Scout and has a graduate degree in Public Service Archeology volunteers by giving back to the community.

Swanson, Steve [97] see Pitezel, Todd

Swantek, Laura (Arizona State University), Jacob Freeman (Arizona State University), Katja Brundiers (Arizona State University) and Erica Reyes (Arizona State University)

[273] *The Impact of Competition for Arable Land on Human Securities: Polynesia as Case Study*
We explore the long-term relationship between adaptive responses to resource scarcity and human-well being in the past for application to the modern problem of feeding a growing population with limited agricultural land while maintaining or increasing human security. Specifically we ask, how were aspects of human well being interrelated in societies that adapted to the scarcity of arable land and what long term trade-offs in human well being might we expect to encounter as consequences of intensifying agricultural production today? To approach this question, we use the archaeological history of four Polynesian island societies, Tikopia, Mangaia, Mangareva and the Hawaiian Archipelago, which adapted to limited agricultural land and growing populations without outside contact for 800 years. We measure three of the United Nations Development Program's seven dimensions of human security, Environmental, Socio-Personal and Food Securities, to better understand how these dimensions are affected by the scarcity of and competition for arable land in each of these island environments. We conclude that trade-offs between these securities are evident in the long term record of Polynesia and the consequences are felt most strongly by the non-elite members of society and offer some points for consideration in modern decision-making.

Swartz, Ayme (The University of Montana) and Kristen Barnett (University of Montana)

[120] *Women in the House: Social Aspects of Grief*
During the 2012 field season at the Bridge River Site, The University of Montana Field School, in collaboration with the X'wisten Band, excavated the roof and floor of the BR 4 occupation, ca. 1838 C.E. at Housepit 54. The southwest portion of this 13-meter diameter house offers evidence of a strongly gendered activity area with implications for interpreting relationships between household members. Several lines of evidence imply distinctly female activities. Excavations unearthed a female infant figurine suggesting to indigenous informants practices of mourning and loss, reproduction, and social grieving. Several spindle whorls and abundant evidence for food preparation, typical residues of women's domestic activities, were found in the same context. This poster offers a review of these data and offers new interpretations of household activities at Bridge River during the Colonial period.

Swartz Dodd, Lynn [48] see Giessler, Kalena

Swavely, Ty [213] see Chenault, Nicole

Sweeney, Angelina, Candice Brennan, Hector Neff (California State University, Long Beach) and Barbara Arroyo (Universidad del Valle de Guatemala)

[186] *Material Provenance Study of a Formative Period Structure: Qualitative and Quantitative Analysis of Concrete and Sediment Samples from Kaminaljuyu, Guatemala*

This poster presents results of recent studies of the building materials used for monumental architecture at the highland Maya site of Kaminaljuyú. We used Fourier transform infra-red spectrometry (FTIR) and x-ray fluorescence (XRF) to characterize samples from the structures of the acropolis and from sediments from non-architectural contexts. The resulting elemental and mineralogical data bear on both the nature of the building materials (mortar, plaster, a mixture of mortar and plaster, or concrete) and whether the constituents were obtained from local sources or imported.

Swiecichowski, Slawomir [200] see Ziolkowski, Mariusz

Swift, Jillian

[138] *Subsistence and Landscape Transformation on Mangareva through the Lens of Rattus Exulans Stable Isotope Data*

The Pacific rat (*Rattus exulans*), first introduced throughout Polynesia by human voyagers, contributed to the rapid deforestation and avifaunal extinctions which often occurred upon human arrival to Polynesian islands. The full nature and extent of *R. exulans'* impact on Polynesian landscapes remains unclear. Their ubiquity in both prehistoric and contemporary Polynesian households suggests that the household was an important ecological niche for *R. exulans*, particularly after the depletion of indigenous floral and faunal resources. Recent excavations in the Mangareva Islands (Gambier Archipelago), French Polynesia, uncovered stratified cultural sequences extending from early colonization to European contact. Remains of the Pacific rat are present throughout the occupational sequences of three different islands in the archipelago: the Nenega-Iti Rockshelter (AGA-3) on Agakauitai, the Onemea site (TAR-6) on Taravai, and "Kitchen Cave" (KAM-1) on Kamaka. Carbon and nitrogen stable isotope analysis of *R. exulans* will evaluate the species' contribution to native landscape transformations after human arrival on Mangareva. The associated archaeofaunal records allow for comparison of Polynesian rat diet with the resources exploited by the sites' human inhabitants, exploring the potential for dietary reconstructions of *R. exulans* to serve as a proxy for human diet and resource use.

Swift, Marilyn K. [219] see Toomay Douglas, Michele

Swisher, Kimberly (The Ohio State University), Clark Spencer Larsen (The Ohio State University), Victor D. Thompson (University of Georgia, Department of Anthropology) and Paul W. Sciulli (The Ohio State University)

[6] *Temporal Trends in Skeletal Morphology in Biocultural Context from the Prehistoric Georgia Bight*

Along the Georgia coast from the Middle Woodland to the Mississippian period, habitation sites appear to increase in frequency and to become denser and more clustered overtime. In addition, it appears that the general pattern is for the site locations to shift towards coastal margins. In this paper, we explore the nature of change in skeletal and dental size, linking trends with shifts in population density and resource availability. The data set includes dental, cranial, and post-cranial measurements collected

from a large series of skeletal remains from the Georgia bight. Comparative statistical analyses are used in order to determine relationships between skeletal and dental size in relation to settlement shifts in this setting of the American Southeast. This research has the potential to contribute to a broader understanding of the effects of shifts in subsistence and settlement patterns and for drawing inferences about biocultural adaptation in coastal environments.

Swogger, John (Archaeological Illustrator)

- [269] *Drawn Together: An Illustrated Archaeological Field Journal of a Season's Excavations on Palau, Micronesia*

Archaeological illustration is part of the public face of excavation. But the creative and technical mechanics as well as the influences that shape the final images is often hidden. Clarity about the process of knowledge-creation is an important component in shaping understanding of archaeology as a field practice. For funders, government bodies and the general public, this understanding can create a better appreciation of the challenges and needs of archaeological projects. For archaeology undergraduates and postgraduates this understanding can better prepare them for field career. In the summer of 2012, I spent six weeks as the site illustrator on an excavation project and field school on the islands of Palau in Micronesia. I kept a field journal in comic-book format. This journal will be used as part of the projects' outreach package to funders, local government officials on Palau, and university administration – as well as undergraduates interested in the project's field school and postgraduates interested in research work on the islands. The aim is to stimulate a different kind of feedback through use of a different kind of media, and encourage a different kind of relationship between the project and those whose participation ultimately helps to shape it.

Szczepanowska, Hanna (Smithsonian Institution, Museum Conservation Center)

- [13] *The Space Shuttle Discovery: Cultural and Scientific Legacy*

The Space Shuttle Discovery in its 27 year of service completed 39 missions, spent 365 days in space, orbited the Earth 5,830 times, and traveled 148,221,675 miles. On April 17 2012 NASA transferred Discovery to the National Air and Space Museum to begin its new mission to educate and inspire future generations of explorers.

Two aspects of the Space Shuttle are discussed, the artifact and the scientific objectives of the missions. How technology of the Shuttle design enabled the missions how the mission brought us closer to the space exploration.

The success of any space exploration relies on effectiveness of thermal protective systems shielding the spacecraft from heat or atmospheric reentry and cold while in orbit. The technological challenges of heat shield design, reinforced carbon-carbon is one aspect of the artifact, its perception by the museum visitors is another. The dual role of displaying a flown orbiter is the core of discussing the artifact.

Discovery's, last mission, STS -133, in March 15, 2011 was to deliver to ISS the Permanent Multipurpose Logistics Module to support microgravity experiments in fluid physics and materials science. That last mission is the center of discussing the Discovery's scientific legacy.

Szuter, Christine (Arizona State University)

- [72] *The Digital Third Age: Engagement of the Third Age Generation in Cultural and Heritage Education, Research, Interpretation, and Philanthropy*

The third age is a reflective time in the life cycle where issues of engagement, health, and purpose in life are re-examined and reformulated. The varied health statuses of this generation, from extreme athletes, to weekend warriors, to homebound individuals,

coupled with factors of changes in household size and financial conditions mean that engaging this third-age generation in cultural heritage requires new approaches. This presentation demonstrates how different organizations have reached out to this generation by changing traditional outreach programs of lectures and publishing print books to the digital world of social media, mobile apps, and augmented reality. In addition, organizations with a focus on outdoor activities, such as cycling, trekking, or kayaking, are including cultural heritage activities as a key component of their offerings. The results of these efforts include increased philanthropy and membership for cultural heritage organizations and increased well-being and life-long learning for the third-age generation.

Taala, Sabrina (Pikes Peak Community College)

- [251] *Ordnance as Artifact: The Role of Explosive Materials on JPAC Sites*

Excavating sites in search of the remains of missing US servicemembers necessitates a distinctive style of archaeology because of a number of exceptional factors. One of the most unique elements of these types of sites is the common presence of a variety of ordnance, both fragmented and unexploded (UXO). This material often dictates certain alterations in excavation strategy. Considering the role of ordnance artifacts at a site is necessary for an understanding of site formation processes and overall site interpretation. Ordnance varies widely based on geographical, temporal, and functional factors, as well as source of manufacture.

This presentation will survey common ordnance types found at WWII, Korean War and Vietnam War sites excavated by JPAC teams. It will discuss ways these materials affect the contextual relationship of elements within the sites, and what implications different materials have for overall site analysis. The presentation will also briefly outline what general methods JPAC teams use to mitigate the hazards of these materials. Specific sites where the presence of ordnance has impacted site interpretation and excavation strategy will be presented as illustrative examples.

Tabarev, Andrei [222] see Gillam, Christopher

Tache, Karine (University of York) and Oliver Craig (University of York)

- [258] *Patterns of Early Pottery Uses in Northeastern North America: Insights from Organic Residue Analysis*

For a long time the earliest ceramic vessels were associated with food production and sedentary village life. With new discoveries and redating, however, pre-agricultural pottery use has emerged as a problem with broad social and economic implications. The range of potential incentives for the adoption of pottery and the variety of wild resources available are some of the challenges facing the study of pottery innovation among hunter-fisher-gatherers. Here, the contributions and limitations of organic residue analysis to such studies are discussed in relation to early pottery from Northeastern North America (ca. 3000-2400 years BP). Data obtained thus far suggest differences between the resources, or mixtures of resources, processed at coastal sites and those processed inland and at riverine sites. Variability within each of these environments and within single sites is also evident. Nevertheless, initial analyses of lipids reveal the presence of aquatic resources in a majority of the sites analyzed, regardless of their environmental context. Future research will aim at better characterizing the importance of aquatic resources in early pottery from Northeastern North America.

Tacon, Paul (Griffith University)

- [163] *Boats, Dogs and Rock Art: Evidence of a Pre-Neolithic Maritime Tradition in Greater Southeast Asia*

Until recently, the rock art of greater Southeast Asia has not seen much attention in global debates about human cultural evolution

and rock art development. In this paper the earliest rock art of the region is outlined, especially that of Kalimantan and Sulawesi, Indonesia in comparison to mainland Southeast Asia and northern Australia. More particularly, an early stencil and naturalistic animal painting tradition of island Southeast Asia is discussed. New dog DNA sequencing results are also analyzed to support a theory that a sophisticated pre-Neolithic maritime culture of hunter-gatherer-fishers ranged extensively across greater Southeast Asia during the late Pleistocene and early to mid-Holocene before agriculture was adopted and the Austronesian Painting Tradition established.

[163] Chair

Taçon, Paul [163] see May, Sally

Takamiya, Hiroto (Sapporo university)

[167] *The Islands of Okinawa Where Hunter-Gatherers Once Throve*

The islands of Okinawa, Japan, located between Kyushu and Taiwan, provide several unique aspects to the discipline of anthropology when it is viewed in the context of island archaeology. One of these is that the islands witnessed the presence of Homo sapiens in the late Pleistocene. If one reviews island colonization by Homo sapiens, one would recognize that only a handful of islands were colonized by Homo sapiens during the Pleistocene. One of the reasons why Homo sapiens could not live in these islands environments during most of the Pleistocene is that many islands do not provide enough natural resources and/or area for mobile hunter-gatherers. In other words, food production is necessary for people to settle down on an island. Thus many islands were colonized for the first time during the Holocene by farmers. In this presentation, I would like to briefly review Homo sapiens colonization of these islands. Then I would like to introduce the subsistence strategy of the Holocene colonizers of the islands of Okinawa. The results will provide a new aspect not only to island archaeology, but also to hunter-gatherer studies.

Talbot, Richard [175] see Richards, Katie

Tallman, Sean (JPAC-Central Identification Laboratory) and Mindy Simonson (JPAC-Central Identification Laboratory)

[251] *Challenging Archaeology: Archaeological Approaches to the Recovery of Human Remains from Papua New Guinea*

The ongoing excavation of a WWII-era B-24 aircraft that crashed with nine U.S. servicemembers in a coastal mountain range in Papua New Guinea represents an ideal case through which to examine the complexities involved in the recovery of human remains from military loss locations by the Joint POW/MIA Accounting Command's Central Identification Laboratory (JPAC-CIL). The remote location of the aircraft crash site within a steeply-sided, high-altitude rainforest ravine presents numerous environmental challenges that require unorthodox resources and planning in order to access the site and execute a proper recovery. Nearly 70 years of significant erosion and landslides caused by continuous, heavy rainfall has resulted in complex depositional episodes. Severe, quickly changing weather and mountainous terrain can hinder access to the site, while deep, water-saturated sediment on steep slopes poses a threat of landslides during excavation and continued destruction of the site. Though the use of helicopters, mountaineering equipment, erosion prevention methods, and the employment of an indigenous workforce can help to mitigate some of these logistical issues, the challenging topography and unique site formation processes have resulted in a multifaceted archaeological recovery. Such challenging conditions require the simultaneous employment of well-developed archaeological methods and the intensive management of logistical concerns.

Tamara, Barylski [235] see Bria, Rebecca

Tamsin, O'Connell [60] see Hermenegildo, Tiago

Tang, Jigen [38] see Zhang, Hua

Tang, Amanda (University of Maryland, College Park) and Jocelyn Knauf (University of Maryland, College Park)

[69] *Meals of Modernity: Engaging with Domesticity in Annapolis, Maryland during the Progressive Era*

The Progressive Era of the late-19th and early-20th centuries imbued Americans with new concepts of sanitation. The ideals of modernity in the domestic science movement promoted the transformation of food through technology, in efforts to produce meals that were more uniform, sterile, and predictable. The city of Annapolis, Maryland and its residents in the Fleet and Cornhill Street neighborhood were not exempted from the influences of this period. The foodway remains of working-class black renters living at 40 Fleet Street between c.1885 and 1930 are examined for the extent of engagement in the home economics rhetoric of the time as well as negotiations with racism. Zooarchaeological data, combined with bottle glass, evidence of canned goods, and ceramics primarily informed this research project. Although a small assemblage, the research speaks to how foodways were tied to ideas of domesticity and public health in Annapolis. To do this, the authors considered various lines of archaeological and historical evidence to comprehend changing concepts of the proper way to feed a family, to trace the increased separation of people from animals and livestock, and also how residents progressed from being a food-producing household to one based on the market consumption of food products.

Tankersley, Kenneth (University of Cincinnati)

[174] *Saving Sequoyah's Oldest Written Record*

The Red Bird River Shelter (15CY52) is located on the west side of the Red Bird River in Clay County, southeastern Kentucky. The site is listed on the National Register of Historic Places (89001183), and it is the gravesite of Dotsuwa (Red Bird), a Cherokee who was murdered nearby by two men from Tennessee in 1796. Considered a sacred site, the sandstone cave contains traditional Cherokee engravings by Red Bird, the oldest known writings of Sequoyah, and the oldest known example of the Cherokee syllabary. In 2002, descendants of Red Bird and the Piqua Shawnee tribe learned that the location of the site was wrongly recorded and slated for destruction as part of the construction of a new gas pipeline. Working with representatives from Daniel Boone National Forest, the Piqua Shawnee tribe was able to successfully divert the pipeline project and save the site.

Tankosic, Zarko (Indiana University) and Renate Storli (University of Hamburg, Germany)

[83] *Landscape and Society: Preliminary Results of the 2012 Field Season of the Norwegian Archaeological Survey in the Karystia (Euboea, Greece)*

In our paper we present the preliminary results of the first season of an archaeological survey project in southern Euboea (the Karystia, Greece) in light of archaeological data collected in the area previously. The project represents the continuation of efforts to survey the entire Karystia and provide a comprehensive analysis of long-term social construction of landscapes and their economic use. In 2012 we surveyed 473 ha of the survey area and located 22 concentrations of archaeological material ("findspots") and a large number of isolated finds dated from the end of the Neolithic to the Roman times. In this paper we focus on prehistoric

data from the survey. We demonstrate that it is possible to discern different kinds of contemporaneous landscape organization and use patterns in similar agriculturally suitable parts of southern Euboea during the Final Neolithic and the Early Bronze Age (c. 4500–3300 B.C.E.). We argue that this evidence can be used not only to reconstruct the economic bases of landscape exploitation but also to shed light on the contemporary sociopolitical structure of the local communities.

[83] *Chair*

Tantaleán, Henry [214] see Stanish, Charles

Tarascio, Katherine (University of Massachusetts, Boston)

[264] *Whitehall: Newport's History in a House*

Whitehall is a historic house museum located in Middletown, Rhode Island, and is currently interpreted as the residence of the famous Irish philosopher and author of "The Alciphron", Dean George Berkeley. Berkeley, however, only lived on the property for three years. During its 300 year history, Whitehall was operated as a tea or coffee house, a quartering house for British troops during the American Revolution, a farmstead, and a restoration project during the early nineteenth century preservation movement. Using historical documents and photographs, geophysical data, and artifacts uncovered during the June 2010 excavation, this study aims to encourage the expansion of the current interpretation. It seeks to demonstrate that Whitehall is an informative microcosm of the surrounding area. It also seeks to demonstrate how landscape archaeology and an archaeology of poverty can be used to examine the juxtaposition of the extreme wealth of the Gilded Age residents on Bellevue Avenue, barely five miles away in downtown Newport, with the impoverished inhabitants of Whitehall during the mid-nineteenth century. In this way, it serves to broaden the understanding of the living conditions experienced by those impoverished by the failure of their farm due to the increasing industrialization of the northeast.

Tarkan, Duygu [32] see Tung, Burcu

Tarle, Lia (Simon Fraser University), Dennis Sandgathe (Simon Fraser University) and Mark Collard (Simon Fraser University)

[183] *Clothing and the Replacement of Neanderthals by Modern Humans*

Between 40,000 and 25,000 years ago, during the cold, dry period known as Oxygen Isotope Stage 3, modern humans migrated into Europe and replaced the Neanderthals. Here, we report a two-part study in which we investigated whether clothing could have played a role in this replacement event. In the first part of the study, we carried out a systematic review of the use of mammals for clothing among mid-to-high latitude non-industrial societies in order to identify taxa whose remains can be interpreted as evidence for utilitarian clothing. In the second part of the study, we statistically compared the relative frequencies of the above taxa in Neanderthal-associated and early modern human-associated archaeological occupations from Europe. The results of the analyses suggest that modern humans made utilitarian clothing out of a wider range of taxa than Neanderthals. They also suggest that the clothing produced by modern humans was more thermally effective than the clothing made by Neanderthals. Fur ruffs, which are important in polar environments today, may have been a modern human innovation. These findings are consistent with the idea that clothing played a role in the replacement of Neanderthals by modern humans.

Tate, Sarah (University of Wisconsin-Madison)

[221] *Bad Blood: An Examination of the Role of Federal Recognition and NAGPRA on American Indian Identity*

An individual's sense of identity relies heavily on access to one's heritage. Among indigenous groups who suffered from colonial policies of assimilation, reclaiming and preserving elements of the past is necessary in order to ensure current and future generations intimacy with their own culture. By this logic, the perpetuation of culture correlates directly with identity formation. Unfortunately, colonialist political policies continue to threaten indigenous cultures worldwide. Within the United States, federal recognition policies determine an American Indian tribe's 'legal' existence. Since legal legitimacy is required in order to take advantage of national programs protecting native heritage, recovering traditional life-ways becomes contingent on the ability to satisfy a foreign culture's criteria of 'nativeness.' In this paper, I argue that tribes without federal recognition have less access to their own material culture and are therefore being barred access to elements essential to their identity. Through examination of NAGPRA repatriation participation and cultural program prevalence from tribes with and without recognition, I test the validity of the argument that recognition plays a significant role in preserving culture and therefore a 'native' identity. In a rapidly globalizing world, addressing post-colonial political policies that continue to alienate minority groups ensures greater cultural diversity.

Taube, Karl

[63] *The People of Corn: The Ancient Maya and Maize Deities of Early Classic Teotihuacan*

For many years, it has been recognized that Teotihuacan heavily influenced the ancient Maya, with Teotihuacan motifs and themes continuing to be evoked during the Late Classic period, centuries after the demise of Teotihuacan. However, there is increasing evidence that the people of Teotihuacan were also very aware of the Early Classic Maya, including not only Maya ceramic imports from the Petén but also locally made Teotihuacan vessels in Maya style. In addition, the Realistic Paintings mural fragments from the Tetitla apartment compound at Teotihuacan are rendered in clear Maya style and even contain Mayan glyphic texts. One of the prominent entities in the Realistic Paintings murals is the maize deity, clearly related to the Early Classic Maya god of corn. However, this same being appears on a great many locally made Teotihuacan figurines as well as effigy vessels, and thus seems to be the preeminent maize deity at the site. In this study, it will be argued that the Teotihuacan maize god was ethnically Maya, that is, the face of corn was a Maya face, and was the probable origin of later maize deities of Central Mexico, including the Aztec Cinteotl.

Tayles, Nancy [219] see Halcrow, Sian

Taylor, James (University of York)

[9] *Making Time for Space at Çatalhöyük: Exploring Spatiotemporality within Complex Stratigraphic Sequences Using GIS*

This poster presents current research work exploring the inherent temporality embedded with the stratigraphic sequence of the complex tell site of Çatalhöyük. Utilizing the temporal capabilities of ArcGIS 10 to generate a dynamic intra-site spatiotemporal model, the aim is to both visualize the stratigraphic sequence in a more dynamic and intuitive way (beyond conventional methods of phasing and periodization), and develop a spatiotemporal model that is robust enough to support fully integrated spatiotemporal analysis of the excavation data and associated material culture. Recent field-seasons have seen comprehensive efforts to digitize all the single context excavation data, with a focus upon full integration of all aspects of digital archive into an intra-site GIS, as an aid to analysis and interpretation. This poster outlines the methods used to extract a more nuanced corpus of temporal data from the stratigraphic sequence using conventional Harris Matrix diagrams. The temporal information is then combined with the spatial data so that we can examine the way the site changes in

space - through time. Can advances in computing help us to do this in a more nuanced, thoughtful and clear way? Can they help archaeologists (and the public) understand the development of the site more clearly?

[9] *Chair*

Taylor, Robert [54] see Morrow, Juliet

Teeter, Wendy (Fowler Museum at UCLA)

[174] *Consultation and Partnerships in a Museum: Putting Intention into Practice*

While many museum professionals think of cultural materials from their disciplinary perspective, descendant communities often have more personal/familiar relationships and traditional care practices. These differences can lead to misunderstandings and sometimes oppositional viewpoints. However, it is through increased communication and mutual understanding that gaps can be bridged to provide better care and education for all parties. This presentation will provide some of the insights learned over the years to nurture better relationships for consultation and innovative partnerships.

Temple, Daniel (University of North Carolina Wilmington)

[194] *Stress Chronology and Periodicity among Late/Final Jomon Period Foragers from Hokkaido*

This study reconstructs stress chronology and periodicity among Late/Final Jomon period (ca. 4000 to 2300 B.P.) foragers from Hokkaido using incremental microstructures of enamel and linear enamel hypoplasia (LEH) defects. High resolution tooth replicas were examined using an engineer's measuring microscope. Enamel surface and perikymata spacing profiles were produced for five (5) individuals from four archaeological sites. LEH defects were identified according to enamel surface depressions and accentuated perikymata spacing and chronologically matched across the dentition. Age-at-defect formation was established using chronological deciles for each tooth. Median age-at-defect formation was 3.1 years, while the vast majority of these defects are found after 3.0 years of age. Mean and modal periodicity between stress episodes was 0.3 years (3.0 to 4.0 months). Defects found at ages older than 3.0 years are likely associated with weaning. Mean and modal periodicities (0.3 years) may track with resource availability in a region where accentuated seasonal shifts are found.

Tengan, Ty (University of Hawai'i, Ethnic Studies and Anthropology)

[169] *Towards an 'Aina Anthropology: Reflections from the University of Hawai'i*

The Hawaiian term 'aina means land, literally "that which feeds." This distinguishes a land with people on it from a moku (literally "cut off"), a land section defined by its borders. This presentation proposes that a focus on 'aina in the practice of anthropology in Hawai'i provides a way of crossing the boundaries of subdisciplines (archaeology and cultural anthropology), disciplines (anthropology and Hawaiian studies), and academia (university and community), which ultimately will support Kanaka 'Owi (Indigenous Hawaiian) exercise of kuleana (rights and responsibilities) and repossession of ancestral place. Recent developments at the University of Hawai'i at Manoa point to both the possibilities and problematics of establishing such an 'aina anthropology, with a focus on a partnership with the Kamehameha Schools to conduct a field school on the North Shore of O'ahu in the moku of Waialua.

[203] *Discussant*

Terrell, John (Field Museum of Natural History)

[167]

Prehistory in the Pacific Islands: The Possible and the Actual

A generation ago there were chiefly three alternative ways of trying to see the proverbial "forest for the trees" when it came to the study of Pacific Islands prehistory. These competing strategies were creating contrasting narratives about (1) prehistoric peoples, (2) the evolution of cultural complexity, or (3) islands as places where general as well as particular lessons may be learned about the human experience. Nowadays we know a great deal more than we did then about many of the local "trees" in this "primeval forest" thanks to the research productivity of several generations of Pacific scholars and significant advances in available analytical technologies. Yet there is little consensus today on what kind of a "forest" we are looking at. We explore several formal models of island life leading to testable hypotheses to illustrate a few of the ways that Pacific archaeologists can move beyond the old research paradigms of our post-war foundational past.

[161] *Discussant*

Terrenato, Nicola [105] see Opitz, Rachel

Terry, Karisa [147] see Lubinski, Patrick

Terry, Richard (Brigham Young University), Eric Coronel (Brigham Young University) and Daniel Bair (Brigham Young University)

[207] *Portable X-Ray Fluorescence for Elemental Analysis of Ancient Activity Area Soils and Floors*

Portable X-Ray Fluorescence (pXRF) technology could be implemented in elemental analysis of ancient activity area soils and floors. The pXRF instrument was tested for accuracy at different levels of soil moisture, granule size, along with comparison of analysis using standard reference materials. The pXRF trace metal analyses were significantly correlated with the soil standard reference materials for Cu, Fe, Mn, Zn, Ti, Sr, Zr, and Pb. It is recommended for the field laboratory that soils be air-dry, and aggregates crushed and sieved (< 2 mm) for better accuracy and reproducibility. A case study of the elemental composition of contemporary activity areas in the central plaza of Telchaquillo is reported.

Terry, Karisa (Central Washington University), Ian Buvit (Central Washington University) and Mikhail V. Konstantinov (Transbaikal State Humanitarian-Pedagogical Univers)

[222] *Technological Innovation or Dispersion? Transmission of Upper Paleolithic Core Reduction in the Transbaikal, Russia*

The Transbaikal region likely served as a passageway between Central and Northeast Asia during the Upper Paleolithic as populations expanded or contracted across these regions. We attempt to track possible demographic changes within southern Transbaikal from roughly 35,000-19,000 14C BP through analysis of morphometric and attribute data on cores and their by-products (flakes, blades, microblades). Specifically, we examine the transition from Levallois-like flat-faced cores, to microcores, and finally to microblade cores. We attempt to answer whether new core forms reflect human migration or local innovation. We then correlate changes in core reduction technology to environmental stress factors associated with changing climatic regimes and possible effects of population density to understand why cores changed as they did.

Thakar, HB (University of California, Santa Barbara)

[291] *Dates, Diet, and Demography: A Detailed Chronological Framework for Evaluating Diachronic Subsistence Variation and Population Growth on the Northern Channel*

Islands

Changing frequency of radiocarbon-dated components through time suggests a period of significant population growth on the Northern Channel Islands of California after 1600 cal B.P. Extensive research regarding the emergent complexity evidenced among hunter-gatherer populations in the Santa Barbara Channel Region of coastal California highlights significant population increase as a central factor in the rapid cultural development evidenced during the Late Holocene. However, comparatively little research seeks to elucidate why or how population growth occurred. I present a portion of my dissertation, which considers the nature and timing of inherent population growth among hunter-gatherer populations. In this research, statistical analysis integrates a rigorous program of high precision AMS dating, detailed stratigraphic observations and artifact occurrence, providing a refined chronological framework for three archaeological sites on Santa Cruz Island. This analysis reveals discrete periods of occupation, differential rates of accumulation, and evidence of contemporaneous deposits between shell middens located in discrete microenvironments. These results suggest that diachronic variation in land and resource use may explain significant population growth on the Northern Channel Islands after 1600 cal B.P. Well-supported, detailed chronological frameworks are crucial to understanding the broad demographic implications of subtle dietary changes.

[168]

Chair

Thalmann, Olaf (University of Turku), Matthias Meyer (Max-Planck-Institute for evolutionary Anthropology), Mietje Germonpré (Koninklijk Belgisch Instituut voor Natuurwetenschappen), Richard E. Green (University of California Santa Cruz, Santa Cruz, U) and Robert K. Wayne (University of California Los Angeles, Los Angeles.)

[20]

New Insights into Dog Domestication: Inferences from Complete Mitochondrial Genomes of the Most Ancient Dogs/Wolves

The geographical and temporal origin of the dog is controversial. Genetic data suggest a domestication event in Asia or the Middle East about 15,000 – 30,000 years ago, whereas the oldest dog-like fossils are found in Europe dating to over 30,000 years ago. We genetically analyzed the remains of prehistoric wolves and dogs including some of the oldest dog remains described from the New and Old World. Utilizing DNA capture techniques coupled with high-throughput sequencing, we generated complete mitochondrial genomes of those ancient specimen and additional 20 contemporary wolves from North America and Eurasia. Phylogenetic analyses combining the complete mitochondrial genomes of the prehistoric canids with those of a large collection of modern dogs and wolves result in a statistically well supported tree with some haplotypes clustering within modern dogs/wolves whereas others show a basal placement. The latter finding might support a previous notion that a specialized ecomorph of dog-like canids might have existed throughout the northern hemisphere during the late Pleistocene and became globally extinct during the last 20,000 years. We are currently testing this and other alternative hypotheses to better understand the influence of early human society and artificial selection on prehistoric canids.

Thibodeau, Alyson (University of Arizona), Leonardo López Luján (Museo Templo Mayor, INAH), David Killick (University of Arizona) and Joaquin Ruiz (University of Arizona)

[252]

Isotopic Evidence for the Source of Turquoise in Mesoamerica

Turquoise is one of many blue-green minerals that were highly valued and widely circulated throughout Mesoamerica. Although many stones, particularly jade, were used for thousands of years in Mesoamerica, turquoise remained a relatively uncommon stone in the region until the Postclassic. At this time, it became popular among the Mixtecs and Aztecs, who used it as part of elaborate mosaics and other ceremonial and status objects. Because there is little documented evidence of ancient turquoise mining in Mesoamerica, some archaeologists have proposed that turquoise

in Mesoamerica was acquired through trade with the Southwest. In this study, we test the idea that turquoise in Late Postclassic Mesoamerica came from the Greater Southwest by comparing the lead and strontium isotopic ratios of turquoise from offerings at the Templo Mayor (and several other sites) to those of turquoise from sources across the American Southwest and northern Mexico.

Thibodeau, Alyson [252] see Hedquist, Saul

Thibodeau, Megan (Boston University), William Saturno (Boston University), Heather Hurst (Skidmore College) and Francesco Berna (Boston University)

[290]

Maya Pyrotechnology and Plaster: Integrating Micromorphology and Fourier-Transform Infrared Spectroscopy (FTIR) at San Bartolo, Guatemala

Ancient Maya used lime plaster extensively for architecture, decoration and mortar. Much research has been done on the materials and aggregates used for plaster construction in Maya society, but little archaeological evidence has been found of plaster manufacture. Here we report the results of plaster analysis from the Early Preclassic murals found at the Maya site of San Bartolo, Guatemala. Specifically, we illustrate raw material selection and pyrotechnological and construction techniques by integrating micromorphological analysis of plaster thin sections with FTIR. This integration offers the possibility of identifying different forms of limestone and pyrogenic and diagenetic calcium carbonate as well as estimating the temperature limestone was heated to in order to create plaster.

Thomas, David (American Museum of Nat History)

[2]

On the Role of Shellfish Exploitation along the Georgia Bight

Spanning the Atlantic shoreline along three states, the so-called "Golden Isles" are unique among the globe's barrier islands. With active Holocene beaches "docked" onto Pleistocene remnants, these "false," "composite" islands provide immediate access to high quality terrestrial and marine resources (especially shellfish). Decades of archaeological research coupled with recent experiments in human behavioral ecology on St. Catherines Island and elsewhere along the Georgia Bight demonstrate the pivotal importance of shellfish exploitation over the last five millennia—linking, to the earliest ceramics in North America, the onset of monumental architecture, long-term patterns of sedentism, and eventually, the rise of hierarchical leadership and social status.

Thomas, Ben (Archaeological Institute of America) and Meredith Langlitz (Archaeological Institute of America)

[91]

Mitigating the Impact of Archaeotourism on Archaeological Sites

Growing interest in archaeotourism has resulted in greater numbers of visitors to archaeological sites. While additional visitors can generate more revenue for local interests, they also increase human impact on the site. Unfortunately, in many cases, not enough has been done to account for these changes. Sites are unprepared for the increased tourism and often do not have the resources or services to meet the greater demand. A few years ago, the Archaeological Institute of America worked with the Adventure Trade Travel Association to put together a manual on responsible tourism. The manual included guidelines for visitors, site managers, and tour operators. This paper discusses the need for the manuals, describes the nature of the collaboration between the AIA and ATTA, and presents ideas for distributing and implementing the guidelines.

Thomas, Judith and Kaitlin Volanski (Mercyhurst University)

[92]

Geochemical Identification of Differential Phosphorus Patterning at the Laundresses' Quarters, Cantonment Burgwin (TA-8), Taos, New Mexico

United States Army laundresses, officially sanctioned to accompany troops in the US western frontier, were provided quarters that were normally placed at a distance from the rest of the garrison and often referred to as Soap Suds Row. During the occupation (1852-1860) of Cantonment Burgwin near Taos, New Mexico, the laundresses processed the soldiers' laundry in their own quarters behind the main compound. Archaeological excavation of Cantonment Burgwin's laundresses' quarters identified the footprint and internal configuration of a four-room building. To locate the laundry washing area, chemical analysis was conducted on soil samples using the Colorimetric method to determine the amount of phosphorus within each sample. The differential phosphorus patterning identified an area near the laundresses' quarters where the washing process had left a phosphorus signature in the soil. This paper summarizes the research conducted to geochemically identify the chemical signature of the extramural activity of laundry washing.

Thomas, Ben [269] see Langlitz, Meredith

Thompson, Daniel

[3] *Multispectral Archaeological Prospection: Case Studies from the Greater Near East*
In recent years, interest in the use of satellite imagery for archaeological site detection has increased rapidly, but to date there have been few studies following an explicit methodology and producing quantifiable results. The purpose of this paper is to present the results of a methodology using multispectral satellite imagery to detect and predict site locations, with the results evaluated using the Gain Statistic – a measure of a predictive model's relative success. The primary study area is in the Dinar Basin of central western Turkey and covers an area of approximately 100 square kilometers. Following a methodology that first calibrates the predictive model by assessing how well known sites can detect other known sites, a set of predicted site- and non-site locations were generated. The results were then groundtruthed and the model's Gain calculated, with encouraging results: Gain for both site- and non-site location prediction were over 0.90, suggesting that this approach offers a superior predictive model than the more commonly employed inductive approach based on variables such as slope, elevation and distance to water. Two additional case studies demonstrate the portability of the model, one around Çatalhöyük in Turkey and the other around Ur in southern Iraq.

Thompson, Victor D. [6] see Swisher, Kimberly

Thompson, Jessica (The University of Queensland), Menno Welling (African Heritage: Research and Consultancy, Zomba,), David Wright (Department of Archaeology and Art History, Seoul N), Flora Schilt (University of Tuebingen, Tuebingen, Germany) and Susan Mentzer (University of Tuebingen, Tuebingen, Germany)

[76] *The Later Pleistocene Archaeological Landscape of Karonga, Malawi*
The northern tip of Malawi contains a rich record of Middle and Later Stone Age behavior in Pleistocene deposits adjacent to Lake Malawi. The sites are situated within a dynamic landscape that has been highly sensitive to documented changes in climate and lake level over the last half million years. Work in the 1960s at several open-air sites hinted at a fascinating diversity of stone artifact manufacture and discard strategies with similarities that could be drawn to later Pleistocene assemblages in southern Africa. However, the chronological, palaeoecological, and depositional contexts within which to situate this diversity were unavailable. New work shows that the sites range from stratified, buried deposits to deflated/exposed surfaces and contain archaeological materials in both primary and secondary contexts. Landscape geometry, landform associations, and geogenic

components of the sites therefore influence dating strategies and require that a local chronology be built from multiple localities, each with its own unique history of post-depositional alteration. Recent archaeological survey, test-pitting, excavation, and analysis of landscape morphology in the Karonga District of Malawi has now begun to reveal meaningful patterns in where these sites are located, how well they are preserved, how they were formed, and how old they are.

Thompson, Kevin

[123] *When the Going Gets Weird, the Weird Turn Pro: The Navajo-Gallup Water Supply Project*
Construction of roughly 300 miles of primary pipeline for the Navajo-Gallup Water Supply Project was authorized by Congress in 2009 and made the Department of the Interior's top-priority national undertaking by Presidential decree for 2012. The project will settle a decades-old water rights treaty dispute, bring potable water to two Indian nations, and assure a 25-year supply to the largest city in western New Mexico. The "problem"? Archaeology — the San Juan Basin possesses one of the highest site densities in the US. After being selected by the Bureau of Reclamation to drive the cultural resources program for this multi-year undertaking, PaleoWest Archaeology assembled a diverse team to handle the various tasks including inventory, testing, data recovery, ethnography, monitoring, and public outreach. This symposium will be the first in what we anticipate will be an annual series of updates and reports from the team.

[123] *Chair*

Thompson, Victor (University of Georgia) and Thomas Pluckhahn (University of South Florida)

[167] *Engineering Islands and Island Engineers: The Social and Technological Implications of Anthropogenic Landforms along Crystal River*

The Roberts Island Complex is located along the central Gulf Coast at the mouth of Crystal River in Florida. Archaeological excavation of this island has identified a suit of architectural features, which include two stepped platform mounds, mounded midden, linear ridges, and a circular basin feature. The primary component of all of these features is oyster shell. For some features, such as the mounds, shell was intentionally piled up to form architecture. In other parts of the site it appears that midden developed in situ. Based on our most recent work, we suggest that the entire island is an anthropogenic landform that required planning and the mobilization of labor. We discuss the social and technological implications of this finding in relation to the larger Late Woodland landscape of the region.

Thompson, Amy (University of New Mexico) and Keith Prufer (University of New Mexico)

[234] *Detection and Evaluation: The Use of LiDAR in Archaeological Contexts at Uxbenká, Belize*

This poster discusses the application of Light Detection And Ranging (LiDAR) for identifying and evaluating archaeological and environmental features at the Classic Period Maya center of Uxbenká, located in the Toledo District of southern Belize. Dense tropical foliage and steep terrain in this region have made traditional archaeological survey difficult and affect the resolution of analysis using remote sensing methods. LiDAR provided high-resolution bare-earth imagery that was analyzed using geospatial tools. We will compare and evaluate pre-existing terrain and hydrology maps to those created from LiDAR data. This poster presents a model for detecting archaeological settlements based on recovery of vegetation in areas disturbed by local farming practices.

Thompson, Adam (FSM Archaeologist)

[244] *The Early Settlement of Mwoakilloa Atoll*

Recent excavation on the island of Mwoakilloa has provided a date of 1750 B.P. for its initial settlement. This finding corresponds with early dates obtained from intertidal zones on Pohnpei and Kosrae which lie to the west and east of Mwoakilloa respectively. Further volcanic stone found in these early layers on Mwoakilloa has been sourced using XRF to Pohnpei and other material is believed to come from Kosrae. The combined evidence suggests a dynamic pattern of interaction and migration across the Eastern Caroline islands extending to the Western Caroline islands where a date of 1800 B.P. was obtained on Fais atoll. Land snail evidence suggests that this early migration may also have brought pit cultivation from the Marshall Islands where settlement occurred slightly earlier.

Thomson, Marcus (UCLA Geography) and Glen MacDonald (UCLA Geography)

[129] *A Critical Review of Holocene Palaeohydrology and Palaeohydroclimatology of the Nile and Eastern Mediterranean*

The Fayum depression is ideally placed as a virtual gauge on climatic trends along the Nile catchment, including signals from East and West African precipitation regimes. Recent work has suggested mid-Holocene occupational changes in the Fayum associated with specific climate regimes. We will review Holocene Nile palaeohydrology and eastern Mediterranean palaeohydroclimatology, as well as recent investigations in the Fayum. The sensitivity of the Fayum to Nile variations and regional climatic changes will be assessed and occupation changes will be examined in the context of these two factors.

Thongcharoenchaikit, Cholawit [7] see Van Vlack, Hannah

Thornton, Christopher (National Geographic Society), Kyle Olson (Ohio State University) and Narges Bayani (University of Pennsylvania)

[157] *The Bronze Age of Northeastern Iran: View from the Frontier*

The Bronze Age of Northeastern Iran has been discussed for decades as the homeland of the Indo-Aryans, the Iranians, and other archaeologically-nebulous groups. However, our knowledge of this region in the 3rd and 2nd millennia B.C. is extremely limited, which has not stopped scholars from crafting grand narratives. Recent work on unpublished material from sites in this area has cast new light on this problem, and raises new questions about the spread of the Bactria-Margiana Archaeological Complex (BMAC) onto the Iranian Plateau around 2000 B.C.

Thornton, Amanda [204] see Crawford, Dawn

Throgmorton, Kellam (PaleoWest)

[218] *Pit House Architecture and the Expression, Creation, and Maintenance of Social Identity in the Puerco Valley, A.D. 600-900*

During the early Pueblo period the Puerco Valley of eastern Arizona and western New Mexico rapidly changed from hinterland to thriving cultural borderland. This process was influenced by decreasing residential mobility as well as immigration. Ceramic evidence suggests that people from a variety of social backgrounds inhabited the permanent communities that had their origin in the eighth and ninth centuries. This paper uses domestic pit house architecture as a further means of exploring social identity within these newly forming communities. On the one hand, Puerco Valley inhabitants unconsciously reflected vernacular building traditions inherited from their homelands and ancestors. On the other, they consciously negotiated architecture style as they interacted with one another. The formation of villages was a response to growing multi-cultural communities and further influenced the expression of social identity in pit house architecture. By the ninth century this resulted in a patchwork distribution of pit house forms, an indication of the complex and

overlapping social relationships that existed within the early Pueblo period Puerco Valley.

Thulman, David (George Washington University)

[282] *Discussant*

Thurman, Rosanna Runyon (UH-Manoa/ Cultural Surveys Hawaii)

[280] *Archaeological Investigations at a Traditional Hawaiian Site Complex: Systematic Documentation and Community Involvement at Maunawila Heiau*

The presentation will discuss a UH-sponsored archaeological project conducted within a 9-acre land parcel in Hau'ula Ahupua'a, Ko'olauloa District, on the island of O'ahu. The investigation included a surface survey, detailed mapping, subsurface testing, and lab analyses. The presentation will present results on the extent, condition, periods of use, and methods of construction of a traditional Hawaiian place of worship, Maunawila Heiau. The project has been conducted in coordination with the Hau'ula Community Association, Ko'olauloa Civic Club, Hawaiian Islands Land Trust, State Historic Preservation Division, and community members, UH students, and volunteers who participate in work days, site visits, and community meetings.

Thurston, Tina (SUNY Buffalo)

[133] *Rulership, Subjecthood, and Power: Courses of Distributed Governance in Early Northern Europe*

After nearly two decades of debate over the basic nature of societies across Iron Age and Medieval Europe, as well as their individual internal structures, most contemporary archaeologists agree that in many contexts the responsibility for (and right to participate in) governance emanated both from above and below. A number of theories developed or popularized through the work of Richard Blanton have proven to be effective tools for interpreting the spatially and temporally shifting tensions between the branches of a society's internal organization, and the role of ordinary people in the ordering of the polity. These societies, as prime examples of 'differently organized states,' provide a window into ancient political structures that have often been difficult to theorize.

Tierney, Meghan (Emory University)

[214] *Representation of the Body in Nasca Sculptural Ceramics*

Scholars have explored the body as represented in the arts of the ancient Americas through performance, dress, shamanic and ritual practice, two-dimensional imagery, to name a few. Rarely addressed, however, is the prevalence of the human form in early period Nasca sculptural vessels (c. 1-450 CE). Through an art historical perspective, this paper explores how the form of the body is related to vessel shape, how the ceramist depicts gender—either explicitly rendered or implicit in other aspects like clothing, and, more generally, how the Nasca represented the human body. One vessel type considered depicts what appears to be a human subject whose face has been obscured by a textile or a head covering, yet has modeled facial features. When considered alongside the common Nasca practices of cranial deformation and head taking, these sculptural objects might help us better conceive of how the Nasca understood the human body.

Tiesler, Vera (Universidad Autónoma de Yucatán) and Andrea Cucina (Universidad Autónoma de Yucatán)

[46] *Ancient Maya Courtly Life, Living Conditions, and Health (Problems) in the Context of Social Inequality*

Within state level societies, social inequality is expressed in every

aspect of human group interaction and social insertion determines individual life experiences and, ultimately, physical well-being. This paper elaborates on this conjecture by comparing the oral health, degenerative disease and, ultimately age-at-death, of central urban Maya populations. To this end we compare the information of some 500 skeletons from eight urban centers, retrieved either from common urban dwellings, elite residences, or dynastic tombs. Our results, when age corrected, and related to the mortuary markers of social status, indicate differences in the prevalence of disease between the cohorts and highlight that benefits and health costs of dynastic lifestyle are gender-dependent and are overall significantly distinct from the remainder of the population. The health problems, recorded among many paramounts, concretely, degenerative disease, spine ailments and osteoporosis, anticipate dramatically modern, postindustrial styles of living.

Timpson, Adrian [291] see Edinborough, Kevan

Tito, Raul (University of Oklahoma) and Cecil M Lewis (University of Oklahoma)

[41] *Análisis Metagenómico de Coprolitos Humanos*
 El enfoque metagenómico estudia todo el material genético en una muestra ecológica, incluyendo muestras de los ecosistemas del cuerpo humano. Aquí presentamos un análisis metagenómico de datos de coprolitos humanos previamente publicados. Además de los controles de laboratorio, presentamos un enfoque bayesiano para la asignación de fuentes microbianas que puede utilizarse para identificar los contaminantes ambientales en coprolitos, así como la ecología endógena del intestino humano antiguo. Utilizando plataformas automatizadas públicamente disponibles para el análisis metagenómico, como MG-RAST (metagenomics.anl.gov), reconstruimos la composición filogenética y el potencial metabólico del intestino humano antiguo. En consecuencia, el análisis metagenómico de muestras antiguas, constituye una herramienta relevante para arqueología por su potencial para identificar estados de salud, aspectos de dieta y estilo de vida, o inclusive un rango potencial de edad de hospederos humanos extintos.

Tito, Raul [79] see Lewis, Cecil

To, Denise [251] see O'Leary, Owen

To, Denise

[251] *Excavating the Atypical with the Central Identification Laboratory: When the Uncommon and Extreme Become the Norm*
 Unlike archaeology of past societies where excavation methods mirror the theory behind ancient construction and land use, the forensic archaeology conducted by the JPAC-Central Identification Laboratory (CIL) regularly occurs at sites of an extreme nature. JPAC's unique goal of identifying unaccounted-for US service-personnel from past conflicts is accomplished, in part, by the CIL's attention to applying appropriate archaeological methods and techniques to sites that other archaeologists and forensic practitioners encounter only with usual infrequency. This paper explores the sometimes immensely exigent challenges faced regularly by the CIL around the world at sites formed by military aircraft crashes. For the CIL, common practices include excavating while harnessed in rappelling gear, negotiating glacier crevasses, bulk excavation on slopes exceeding 60 degrees, excavation in swampy marshlands too inhospitable even for local nationals, and unearthing large amounts of degraded ordnance. The goal of recovering human remains for identification from these sites places the scope of our work within the realm of modern forensics, but the time lapse incurred since the original incident (and the concomitant site disturbance processes) places our recovery methods within the domain of traditional archaeology.

Our challenge therefore, is accurately blending archaeological methods and techniques with the complexities of extreme sites.

[251] *Chair*

Tobey, Jennifer

[130] *Traditional Knowledge, a Relic from the Past or a Tool for the Future?*

Passed from generation to generation, Traditional Knowledge is a source used to inform archaeologists and an aid in our interpretations of the past. However, while it may rely on the past, Traditional Knowledge is very much part of the modern world. Like any other body of knowledge it is dynamic, adapting or growing over time as new experiences are incorporated with the old. On the North Slope of Alaska, Traditional Knowledge plays an active part not only in the traditions and cultural identity of the Iñupiat, but also in North Slope government policy and activities, federal and state regulatory environments, and activities that industries and development conduct on the North Slope. It is used to inform present and future activities.

This presentation uses the North Slope Traditional Knowledge example to explore Traditional Knowledge's use in archaeology and modern society. It discusses what Traditional Knowledge is in this region, explores its importance in cultural resource identification and management; its importance in management of other environmental resources; and raises discussion points for its future application.

[232] *Discussant*

Tocheri, Matthew W. [10] see Brooks, Alison

Todaro, Simona [288] see Mentesana, Roberta

Todd, Lawrence [10] see Kappelman, John

Toffalori, Elena (Center for Digital Archaeology, UC Berkeley), Michael Ashley (Center for Digital Archaeology), Chacha Sikes (Center for Digital Archaeology) and Dario Ciccone (Map2app, Inc)

[105] *Community Engagement and Heritage Preservation through an iPhone App: Mukurtu Mobile*

In this contribution we present Mukurtu Mobile, a free app that is part of digital heritage management system MukurtuCMS, designed with the needs of Indigenous communities. Mukurtu Mobile combines the usability and social appeal of a micro-blogging application with Mukurtu's granular control over content storage and cultural protocols. Members of a Mukurtu archive can collect digital stories and places of interest on their iPhone that include images, descriptions, categories and protocols, and determine precisely which communities will have access, can comment, download and reuse. Mukurtu's higher purpose is to allow communities to collect, manage and share digital content in their own terms, using cultural and sharing protocols they define. Mukurtu Mobile brings this fine grain self management to a ubiquitous mobile platform. The app was made freely available on the Apple App Store in October 2012. We will discuss the feedback and user case studies since its release, along with plans and future directions.

Toft, Peter Andreas (National Museum of Denmark)

[271] *The Uummannaq Mission: Moravians and Inuit of the Nuuk Fjord, Greenland*

In 1861 Moravian missionaries from Neu Herrnhut and Inuit from the settlement Kukik founded a new mission on Uummannaq. At this small island 70 km inside the Nuuk Fjord, the layout of the

mission followed Moravian principles and at the same time adapted to the local landscape and Inuit culture. Especially the position and layout of the cemetery are a product of both Moravian and Inuit traditions concerning treatment of the dead. During the 39 years of co-existence at the mission, the material culture of the local Inuit was also influenced by the Moravian presence, e.g., the introduction of written language, birth numbers, goats and new crafts such as basket weaving. Another material result of the cultural encounter was the carving of soapstone souvenirs for the missionaries, of which traces can be found at the mission and at the local quarry. Both soapstone objects made for souvenirs and traditional artifacts like steatite lamps were brought back to Europe by the missionaries making the cultural exchange truly dialectical. This paper presents the results of a small-scale fieldwork on the Uummannaq mission conducted in 2007.

Tolman, Chloe [268] see Nigra, Benjamin

Tolmie, Clare [96] see Blackwell, Bonnie A.B.

Tomasso, Antonin [291] see Naudinot, Nicolas

Tomka, Marybeth (UTSA-CAR) and Melissa Eiring (UTSA-CAR)

[182] *How Temperature and Humidity Fluctuations Can Control Your Life: A View from inside an Archaeological Repository*

Temperature and humidity are two of the more dangerous agents of deterioration faced by the museum and repository community in the quest for optimum preservation. Much of the theory for the storage of archaeological collections (Johnson 2003) has been codified in state and federal regulations (the Texas Historical Commission Certified Curatorial Repository Program and 36CFR Part 79). However, the administration and organizational structures of archaeological repositories are very different in scope of materials held and the quantities curated than the typical museum -- hundreds of thousands of whole objects compared to several million artifacts. The mix of collections requiring varying humidity and temperature control also contributes to the difficulty involved in caring for these materials.

This poster presentation will illustrate the buffering effects of creating a microenvironment through the use of polyethylene artifact bags, artifact group bags, the artifact box, and the larger storage furniture, within the confines of a building and the building's exterior environmental fluctuations. It will illustrate how the microenvironment is relatively stable amidst the macroenvironmental fluctuations. These external conditions minimally affect the artifacts and do so at slower rates than the fluctuations documented within the building structure itself.

Tomkins, Helene [2] see Ulm, Sean

Tomoda, Tetsuhiro

[258] *Pottery Diversity and Cultural Connections in Northern Japan*

The Neolithic Culture in Japan is called "Jomon" culture, in general. "Jomon" means "cord-mark" and originates from the design and pattern of ornament. However, there are also some types of Jomon pottery without cord-mark. "Oshigatamon" type pottery and "Shubunotsunai" type pottery are types without cord mark decoration. "Oshigatamon" type pottery is decorated with dowel-impressed pattern and "Shubunotsunai" type pottery is decorated with punctured pattern. This pottery developed from the early to middle stages of the Jomon period in Hokkaido. These are distributed primarily in the northern and eastern parts of Hokkaido, and not the central and southern parts. Meanwhile, there are pottery traditions that are similar to "Oshigatamon" and "Shubunotsunai" pottery in Far Eastern Russia and the Kuril Islands. It is notable that the climate of Hokkaido is similar to the

climate of Far Eastern Russia rather than the climate of the central part of the Japanese Islands. So it could be said that "Oshigatamon" and "Shubunotsunai" pottery was related to pottery not in the central Japanese Islands but, rather, Far Eastern Russia.

Toney, Joshua (Joint POW/MIA Accounting Command (JPAC)) and Michael Hecknerberger (University of Florida Department of Anthropology)

[60] *Scales of Production in the Upper Xingu*

Recent archaeology and historical ecology in Amazonia suggest remarkable diversity, no less than major forested areas across the globe. However, few in-depth field studies are available, making it hard to move beyond broad questions of chronology and culture history. This paper discusses the Upper Xingu, southern Brazilian Amazon, as an example of dynamic change in human-natural systems over the past millennium. It focuses on economic production and land-use, in terms of food and industrial crops, wetland management and domestic production, to consider long-term change across the southern Amazon's "arc of deforestation", including the place of indigenous peoples in this remote corner of the Global South.

Toney, Joshua [60] see Schmidt, Morgan

Toney, Elizabeth (Gila National Forest, Silver City Ranger District) and Aaron Woods (Ph.D. Candidate, University of Nevada, Las Vegas)

[175] *Landscape, Settlement, Communities, and Households in the Mimbres-Mogollon Region: The Role of Small and Medium-sized Pueblos*

Evaluation of settlement patterns provides important information regarding landscape use and sheds light on human adaptation to changing social and environmental conditions. We explore the settlement, establishment, and maintenance of communities and households during the Classic period (ca. A.D. 1000-1150) in the Mimbres region of Southwestern New Mexico. GIS analyses and specific examples from excavated sites are used to explore the formation and distribution of small- (ca. 1 to 10 room) and medium-sized (ca. 11 to 50 room) pueblos. Previous studies of small and medium-sized pueblos in the Mimbres region suggest they were logistic locations used for maintenance of agricultural fields and mobility between larger sites. More recent investigations of small pueblos in the Mimbres-Mogollon region suggest flexible functions, especially in the Post-Classic (Late 1100s). We delineate the possible differences of household and community formation and function in small- and medium-sized pueblos for four study areas which include sections of the Mimbres Valley, the Sapillo Valley, portions of the Burro Mountains, and Fort Bayard area located near Silver City, NM. We also consider issues of autonomy and conformity and speculate that Classic Mimbres communities and households represent an extensive phenomenon that incorporated large areas in to their socio-economic spheres.

Tonoike, Yukiko (Yale University)

[260] *Assessing the Use of Portable XRF to the Study of Human Skeletal Remains: A Case Study Based on the Yale-New Haven Burials*

This paper assesses the use of portable x-ray fluorescence (pXRF) in the analysis of human bones by using the case study of four burials from a mid-19th century cemetery discovered in New Haven, Connecticut. Portable XRF, due to its portability, accessibility, and non-destructive analytical capabilities has become an increasingly popular analytical method in archaeological research. By careful consideration of issues such as matrix-specific calibration and sampling, pXRF results of the human bones excavated from the Yale New-Haven Hospital renovation site were compared to the ICP-MS results (separate presentation in this session), in order to consider whether pXRF would be an useful alternative method of analysis when other more traditional analytical methods are inaccessible or unsuitable.

[260]

Chair

Toomay Douglas, Michele (University of Hawaii at Manoa), Michael Pietruszewsky (University of Hawaii at Manoa), Marilyn K. Swift (Swift and Harper Archaeological Resource Consulting), Randy A. Harper (Swift and Harper Archaeological Resource Consulting) and Michael A. Fleming (Swift and Harper Archaeological Resource Consulting)

[219] *Geographical Influences on Health in Ancient Mariana Islanders*

Previous investigations of health and lifestyle in the Mariana Islands indicated that the prehistoric inhabitants living on the smaller islands of this archipelago experienced more stress than those living on the larger islands. Differences in environment and/or resource availability and the greater impact of natural disasters on smaller islands were cited as possible reasons for these observed differences.

This paper expands on previous research by using one of the largest datasets now available for examining the health of prehistoric skeletons from the Mariana Islands. The indicators of health investigated are cribra orbitalia (CO), linear enamel hypoplasia (LEH), stature, trauma, infection, and dental disease. There is considerable inter-island variability for many of the indicators but generally the highest frequencies of stress are often associated with skeletons from the smaller islands. For several indicators (e.g., stature, limb bone fracture, spondylolysis, alveolar defect) there were no significant differences between islands. These results further suggest that the prehistoric inhabitants of Rota, the smallest island, revealed levels of stress similar to Guam, the largest island. Cultural habits such as chewing Areca (betel) nut and other environmental and cultural differences are examined to explain these differences.

Torrence, Robin (Australian Museum)

[131] *Coping with Catastrophic Environments: Creative Responses to Volcanic Disasters in Papua New Guinea*

The growing number of high quality interdisciplinary studies documenting the catastrophic effects of high magnitude volcanic events on hominid evolution and human history constitute an important critique of archaeology's long held adherence to gradual sociocultural evolution. In contrast, the overwhelming focus on collapse means that cases exhibiting cultural continuity following a volcanic event are largely ignored. It is time to think more carefully at a theoretical level about where, when, to what extent, and why cultural behavior might persist despite exposure to large-scale volcanic events. Could populations inhabiting regions where volcanic disasters are frequent develop effective coping strategies? What role might creative strategies play within catastrophic environments? Using the history of human responses to multiple volcanic events played out over 40,000 years in West New Britain, Papua New Guinea as a case study, it is argued that the spatial scale over which populations can refuge is a key factor in persistence. However, the social strategies that facilitate mobility after a disaster are themselves susceptible to creative manipulations that can engender culture change and collapse.

Torres, Jimena [26] see San Roman, Manuel

Torres-Rouff, Christina [38] see Hubbe, Mark

Torres-Rouff, Christina (UC Merced), Kelly Knudson (Arizona State University) and Emily Stovel (Ripon College)

[286] *Integrative Analyses of the Larache Cemetery, San Pedro de Atacama, Chile: Combining Bioarchaeology, Biogeochemistry, and Mortuary Archaeology*

The expansion of Tiwanaku and its trade networks during the

Andean Middle Horizon (A.D. 500-1000) brought material goods and a pervasive ideology into the periphery, and, some scholars have argued, groups of foreigners who moved between territories. Northern Chile's San Pedro de Atacama oases have a material record that testifies to a longstanding interaction with the altiplano Tiwanaku polity. Among the numerous Atacameño cemeteries, Larache has historically been singled out as a site of foreign influence. Here we explore this question using evidence from cranial modification practices and the mortuary assemblage, both culturally constructed, and from discrete traits and radiogenic strontium isotope analyses, providing us with a multifaceted perspective on the relatedness and geographic origin of these individuals. Combining lines of evidence allows for a more complex view of "foreignness" in the Atacameño past. Our data suggest that Larache was not an enclave for a priestly class of Tiwanaku émigrés, as had been argued decades ago, but rather the burial place for a diverse yet culturally integrated and potentially elite segment of the Atacameño population. Consequently, we argue that issues of power and status warrant more explicit consideration in future analyses of the oases.

Torvinen, Andrea (Arizona State University), Michelle Hegmon (Arizona State University), Matthew Peeples (University of Arizona), Keith W. Kintigh (Arizona State University) and Ben A. Nelson (Arizona State University)

[89] *Assessing the Role of Diversity in the Resilience of Social-Ecological Systems in the Southwestern United States and Northern Mexico*

Previous research by the Long-Term Vulnerability and Transformation Project revealed a strong association between low population density and high social diversity, measured as ceramic ware diversity (Nelson et al. 2011). There was a strong and consistent pattern across a number of cases from the US Southwest, all of which are thought to have relatively little social complexity. However, exploratory analysis of other cases with more evidence of social hierarchy indicates a reversed pattern, in which high population density is correlated with high diversity. These exceptions may imply different strategies of incorporating people of different identities upon formation of the communities. This poster examines these observations with a detailed comparison of two cases with different degrees of social complexity: Central Zuni, in west-central New Mexico and La Quemada, Zacatecas, Mexico. Zuni has persisted for many centuries, whereas La Quemada eventually collapsed and its residents dispersed. The study utilizes a series of detailed measures that assess diversity of household organization, local ceramic production, exchanged decorated ceramics, subsistence activities and long-distance connectivity. This analysis provides insights into the role social diversity may play in the overall resilience of social-ecological systems.

Torvinen, Andrea [207] see Snitker, Grant

Toyne, Jennifer Marla (University of Central Florida)

[74] *A Childhood of Violence: A Bioarchaeological Comparison of Large Scale Mass Death Assemblages from Ancient Peru*

While the archaeology of children has slowly become a vital part of archaeological method and practice, one unexplored area includes the roles of children in ritual or combat. Physical violence is not limited to any subsection of society, yet has a great impact when such evidence is discovered in children's remains. Observations of patterns of perimortem skeletal evidence of cut mark and blunt force trauma demonstrate children were not spared in two large archaeological death assemblages; Túcume, northern coast, and Kuelap, eastern montane highlands. One appears ritual in nature, while the other may represent a direct massacre. In both cases, a large number of children were treated to the same degree and type of violent trauma as the adults (males) in the samples. This

paper explores the lack of expected distinction between subadult and adult's experiences of violence and how this expands our understanding of the Andean past revealing that, in death perhaps as in life, children were important social actors.

Tozzi, Carlo [291] see Naudinot, Nicolas

Tratebas, Alice (Bureau of Land Management)

[163] *Comparison of Rock Art Themes between Siberia and North America*

Similar themes and motifs occur in Siberian and North American rock art and some may reflect shared cultural concepts. Some themes link coastal areas, while others occur on interior landscapes within each continent. Masks at sites along the lower Amur River have close resemblances to masks on the Northwest Coast of North America. The petroglyph manufacturing technique also compares between the two areas. Mushroom head anthropomorphs in northeastern Siberia may have counterparts in Alaska. Early ethnographers assumed direct ties between bear ceremonialism in Siberia and North America. Do all depictions of bears in North America symbolize concepts shared with Siberian counterparts or are some images related to concepts that originated in North America? More detailed investigations of shared themes may provide evidence concerning the peopling of North America.

Trauth, Martin (U Potsdam)

[215] *Human Evolution in a Variable Environment: The Amplifier Lakes of Eastern Africa*

The development of the Cenozoic East African Rift System (EARS) profoundly re-shaped the landscape and significantly increased the amplitude of short-term environmental response to climate variation. In particular, the development of amplifier lakes in rift basins after three million years ago significantly contributed to the exceptional sensitivity of East Africa to climate change compared to elsewhere on the African continent. These amplifier lakes respond rapidly to moderate, precessional-forced climate shifts, and as they do so apply dramatic environmental pressure to the biosphere. Rift basins, when either extremely dry or lake-filled, form important barriers for migration, mixing and competition of different populations of animals and hominins. Amplifier lakes link long-term, high-amplitude tectonic processes and short-term environmental fluctuations. East Africa may have become the place where early humans evolved as a consequence of this strong link between different time scales.

Travers, Meg (University of New England)

[51] *To Gwion or not to Gwion: Transitions in the Kimberley Rock Art Sequence of Northwest Australia*

Kimberley rock art is renowned for its intricate Gwion Gwion Period paintings. Positioned at the end of this artistic tradition is the Wararrjai Gwion Period, identified by changes in the depiction of human form, colour use, associated dress and weaponry. The Wararrjai Gwion Period is in turn replaced by the Painted Hand Period, which previous researchers have attributed to a different cultural population. This paper focuses on explanations for such changes in the rock art assemblage, providing a clearer understanding of the conditions that led to the demise of the Gwion Gwion Period and the introduction of the succeeding Painted Hand Period. An analysis of shifts in stylistic attributes, spatial distribution and temporal developments of the rock art assemblage and a comparison with contemporaneous social, economic and environmental influences was undertaken. Results suggest transitional rather than abrupt changes occurred within the assemblage, demonstrated by stylistic continuity between the rock art periods. This suggests that although changes occurred, they may not have been the result of diffusion from a different cultural population, rather resulting from changes occurring within the Kimberley.

Travina, Anastasiya

[29] *From Colonial Chronicles to Bootstrap Analysis: The Evolution of Research Methods for Studying Inca Spatial Organization*

Changes in the technology available to researchers may reflect changes in approaches to analyzing the spatial and administrative organization of an imperial society. This paper examines specific archaeological research projects conducted in Peru in the 1980s, which used historical analysis and descriptive statistical methods for analyzing Inca excavations, and contrasts these methods with the contemporary application of GIS software and modern inferential statistics. These excavations served to analyze the settlement and storage house location patterns of the Incas. In this paper, they are compared with the analysis of spatial organization of the same settlements and storage localities in the milieu of geospatial and statistical analysis laboratories of U.S. universities. Through exploring these differences, the paper demonstrates how integrating such instruments as Google Earth, bootstrapping, and Monte-Carlo analysis has altered the perception of the Inca Empire's spatial organization and the view of the Inca domination.

Trein, Debora (University of Texas at Austin)

[290] *Multilocality and Monumental Architecture at the Site of La Milpa, Belize*

This paper discusses the results of the 2012 field season at Structure 3, a large monumental structure at the site of La Milpa, northwest Belize, through the lens of multilocality. These investigations form part of a multi-year doctoral dissertation research that aims to examine the ways in which all members of the Late Classic La Milpa community, not just elites, potentially interacted with monumental spaces. This research aims to complement elite-oriented perspectives that currently loom large in the investigation of monumental architecture in ancient Maya civilization, and extend studies of ancient Maya non-elite groups to monumental contexts. A comprehensive analysis of the composition and distribution of artifact assemblages recovered in and around monumental spaces may infer on the heterogeneity of use and access to monumental architecture, going beyond elite-centered explanations of ancient Maya monumentality. Evidence suggests that Structure 3 was not only a space where ritual and political events associated with the maintenance of an elite were took place. Activities often associated with commoners such as tool manufacture, limestone quarrying, and gardening may also have been a significant component in the history of Structure 3.

Tremain, Cara (University of Calgary) and Geoffrey McCafferty (University of Calgary)

[147] *Carving Traditions in Central America: Analysis of Pre-Columbian Jade and Greenstone Artifacts*

This research arose from the opportunity to analyse a previously unstudied collection of Pre-Columbian jade and greenstone artifacts. Like many collections that derive from museums, little information concerning their provenience was available. In order to better understand their likely provenience, comparative analysis to artifacts from Mesoamerica and Lower Central America was undertaken. Based on visual properties, this study allowed for a better understanding of the presence of distinct carving traditions throughout the Central American region. The presence of distinct traditions has often been linked to the possibility of more than one source of jadeite in Central America. However, there is currently lack of evidence for a source outside of the Motagua Valley in Guatemala, despite chemical studies that have suggested otherwise. The proponents for additional sources have recommended further testing and reconnaissance in Costa Rica, where artifacts have often been identified as visually distinct to those from the Guatemalan source. Thus, not only does this research better inform us about the collection in hand, it can be used as a basis from which to strengthen our understanding about jade and greenstone carving traditions in Central America.

Trentelman, Karen [253] see Walton, Marc

Tresset, Anne [20] see Ollivier, Morgane

Triadan, Daniela (University of Arizona)

- [171] *Continuity and Change in the Formation of Preclassic Domestic Space at Ceibal, Guatemala*

Excavations at the Maya site of Ceibal have revealed very early patio group formations with domestic structures, dating to at least the Late Real-Xe Phase (circa 700 AD) of the early Middle Preclassic. After their founding, these places continued to be occupied for almost 2000 years albeit with changes in the use of space at specific times that may elucidate pivotal social and political changes in the community. The new data from Ceibal provide new insights into the formation, use, and maintenance of domestic space in the Early Middle Preclassic, as well as the beginnings of social differentiation in the Maya lowlands.

- [21] *Discussant*

Triadan, Daniela [64] see Montgomery, Barbara

Tringham, Ruth [105] see Ashley, Michael

Tringham, Ruth (Univ of California-Berkeley) and Pietro Ferraris (Map2App.com)

- [105] *A Mobile App to Enhance Visits to Heritage Places: The Example of Angel Island*

In this paper we present an application created using the map2app mobile platform to a particular cultural heritage location – Angel Island in the San Francisco Bay, currently a State Park that is a popular destination for visitors who explore its buildings from the US military occupation of the late 19th and early 20th centuries, as well as its landscape with spectacular views on San Francisco and its bay. Recently it was also home to a roving performance of the Odyssey, for which we published an iPhone app to enhance the island experience for the audience. We are adapting this app for visitors to the Angel Island park to enhance their experience with “now and then” photos, videos and audio and stories that engage visitors in the history of the places as they explore the island. This project emerges out of a dream for video-tours at Çatalhöyük using a technology that at that time did not exist. We will argue that the development of such apps act as interpretive platforms for tangible, invisible, and intangible heritage, and can be created inexpensively by interpreters themselves while engaging visitors in an active participation in and contribution to the interpretation of cultural heritage.

Tripcevich, Nicholas [33] see Kimber, Tom

Tripcevich, Nicholas (UC Berkeley)

- [225] *Where to Pasture the Llamas within Town? Herders and Farmers in the Andean Highlands*

In the present day, Andean divisions between areas dedicated to herding and to farming are largely ecological. However, projecting these distinctions into antiquity is problematic. The steep and relatively narrow Andean cordillera contains altitudinally determined production zones, yet highland Andean families and communities often strive to diversify their production and, therefore, the pastoral/non-pastoral interface may occur within a single family. This paper focuses on the herding and farming interface in the Andes where herders and caravans serve as the mobile component of highland communities that have extensive areas dedicated to cropland. Some material aspects of this

relationship may be preserved archaeologically, such as corral features, walls protecting crops, and long distance transport items. Other elements are more ephemeral, such as scheduling, territoriality, exchange relationships, and choices regarding herd and crop management. Despite modern changes in herd profiles, transportation, and economy, much can be learned about the strategies of ancient herders and non-herders in the central Andes.

Tromp, Monica [47] see Dudgeon, John

Trout, Lukas (University of Nevada, Reno)

- [148] *Analysis of an Alpine Lithic Assemblage: Flaked and Ground Stone in Wyoming's High Rise Village*

Preliminary analyses of sampled flaked and ground stone assemblages from western Wyoming's High Rise Village document minimal temporal and spatial variability in occupant behavior. While ground stone is associated with each of the site's 52 lodge pads, biface thinning and retouch flakes dominate lithic assemblages and indicate tool manufacture for hunting and animal processing. Imported and cached lithic materials evince investment in returning to this particular site, as High Rise Village may have been a destination for residentially mobile hunter-gatherers. An in depth analysis of flaked and ground stone assemblages is needed to confirm preliminary conclusions as well as to discern previously unidentified trends in occupant behavior, i.e. temporal and spatial patterns in resource procurement and processing. This analysis will also assist with determining why High Rise Village inhabitants continually utilized this specific high-altitude location for over 2,000 years.

Trowbridge, Meaghan [85] see Unruh, David

Trubitt, Mary Beth (Arkansas Archeological Survey), Anne S. Dowd (ArchæoLOGIC USA, LLC) and Meeks Etchieson (U.S.D.A. Forest Service)

- [142] *Multiscalar Analysis of Quarries*

Quarries come in all sizes, as did the groups who used them. In this paper, we evaluate two case studies: the Spanish Diggings novaculite quarry complex in Arkansas and the Starks Pleistocene cobble quarry in Wyoming. Large and small quarries provide interesting contrasts in extraction scales, raw material uses, seasonality, work group sizes, and transport distances and directions. Both examples were predominantly used during the Middle Archaic periods in their respective regions (ca., 8,000-6,250 B.P. in Arkansas and 5,500-2,500 B.P. in Wyoming). Multiscalar analysis of the settlement contexts of these quarries shows variation in resource extraction intensity and differing material distributions across the localities and regions. These case studies provide an intriguing perspective on how group sizes and settlement scales influenced prehistoric stone quarrying technology, and may ultimately inform our discussions of emerging inequalities among hunter-gatherer societies.

Truman, Elizabeth (Washington State University), Melissa Goodman-Elgar (Washington State University), John Dorwin (Kalispe Tribe of Indians), Stan Gough (Eastern Washington University Archaeological and H) and Nancy Stenholm (Botana Labs)

- [224] *Exploration of Geoarchaeological Methods for Occupation Sites In the Pacific Northwest*

45PO429 is an ethnographically known summer occupation site of the Kalispel Tribe of Indians with prehistoric, protohistoric and historic elements along the Pend Oreille River, WA. Photographic documentation by Edward S. Curtis indicates the site's historic use. 45PO429 is currently being tested for eligibility for the NRHP. We present the results of geoarchaeological field and lab

assessments used to aid in analysis of selected occupation areas and features. Features were identified using known parameters from the ethnographic record. Knowledge regarding duration of occupation and primary or secondary use of features was explored using a simple suite of methods (PSA, EC, pH, LOI) in addition to thin section analysis. Experimental burning was also undertaken to aid in identification of feature use and duration. It is considered that by utilizing simple geoarchaeological analysis to aid in documentation of the site a stronger case is made for inclusion. The relative ease of analysis is also worth considering for future site testing.

Tryon, Christian A. [10] see Brooks, Alison

Tserendagva, Yadmaa [240] see Schneider, Joan

Tsesmeli, Evangelia (Southern Methodist University)

[85] *Along the River They Went: Mobility in the Middle Rio Grande Basin*

The Middle Rio Grande basin consists of several major tributaries draining into the Rio Grande with valleys and watersheds encompassing an area of about 3000 square miles in central New Mexico. Archaeological surveys, excavations and CRM projects have shown that the basin enjoyed a remarkable continuity with distinct habitation patterns from the Archaic period to the end of the 15th century A.D. Ethnographic and archaeological investigations have indicated the use of trails along riverine routes to facilitate movement of people and exchange of commodities on the ground. A closer look at the material record provides insights into the mobility patterns and the social landscape of the basin residents during the tumultuous 13th -15th centuries A.D., and identifies differences and similarities of movement and habitation among the various social groups navigating the distinct landforms that comprise this important ecosystem.

Tseveendorj, Damdinsuren [22] see Lee, Sang-Hee

Tsoraki-Chan, Christina [32] see Carter, Tristan

Tsukamoto, Kenichiro (School of Anthropology, University of Arizona) and Jessica I. Cerezo-Román (School of Anthropology, University of Arizona)

[57] *A Body of Lakam Officials: The Study of Burial 1 at the Guzmán Group of El Palmar, Campeche, Mexico*

In Late Classic Maya society subordinate elites, with the title of Lakam, often appear in courtly scenes painted on polychrome vessels, but their physical characteristics have remained unknown. Epigraphic studies of a hieroglyphic stairway suggest that the north peripheral area of the Classic Maya center of El Palmar was occupied by Lakam officials during the Late Classic period (ca. A.D. 650-850). In A.D. 726 they attached a hieroglyphic stairway to their principal temple, Structure GZ1. Contemporaneously, an individual, possibly a Lakam, was buried under its upper shrine and a fire ritual was conducted above the cist. The burial consists of a male individual with the offering of two polychrome vessels. Osteological analyses address the biological profile and life history of this individual while archaeological evidence reveals historical and social clues. The results provide additional insight into the social circumstances of subordinate elites in Classic Maya society.

Tsurumi, Eisei (The University of Tokyo)

[19] *The Early Ceramic from Tembladera and Its Chronological Sequence*

Tembladera is a village located in the Middle Jequetepeque Valley in northern Peru and it is well-known for the looted fine pottery dated to the Initial Period and the Early Horizon. Although these pieces lost contextual information, they can be seen in many

museums and private collections worldwide. The monumental structures near the village dated to these periods also have drawn archaeologists' attention. Unfortunately, many of them were destroyed by the construction of the Gallito Ciego Reservoir and a road associated with it during the 1980s. However, in spite of such severe damages, there still remain a large number of archaeological sites. From 2003 I have directed Tembladera Archaeological Project and excavated 10 sites around the village. Through these intensive investigations, it became clear that monumental architecture continued to be constructed throughout the Late Preceramic Period (Mosquito Phase), the early Initial Period (Hamacas Phase), the late Initial Period (Tembladera Phase), and the Early Horizon (Lechuzas Phase). In addition, diachronic changes in pottery styles were confirmed in accordance with the changes in monumental architecture. In this talk, I will present the variety of pottery styles from this project for the purpose of establishing a fine-grained chronological sequence of the region.

Tsurumoto, Toshiyuki [194] see Fukase, Hitoshi

Tuggle, H. David [280] see Masse, W.

Tuller, Hugh (Joint POW/MIA Accounting Command), Derek Congram (Joint POW/MIA Accounting Command) and Luis Fondevila (Argentine Forensic Anthropology Team)

[193] *Contemporary Mass Graves as Archaeological Features*

Paralleling the development of forensic archaeology as a discipline over the past several decades has been the manner in which contemporary mass graves are processed. In the past, these complex graves were primarily viewed as containers for bodies, and the exhumation of the remains a gruesome task that needed to be done prior to the 'real' science of examining the remains in a laboratory. Often this exhumation activity was conducted with little archaeological input. There was a lack of understanding that the grave feature, the processes that created it (including modification of the surrounding area), and activities that occurred at the scene afterwards (perhaps years later), could constitute criminal evidence, and that thorough archaeological excavation could recover it. In recent years there has been a subtle, yet gradual shift in how these features are viewed and, thus, processed. The inclusion of archaeologists is now common, and the activity has turned from the "exhumation" of bodies to the "excavation" of mass grave features. This presentation will give a brief background to the development and implementation of forensic archaeology at these scenes, the types of evidence that can be gathered for courts, and the ways archaeology can assist in the identification process.

Tuller, Hugh [251] see Stephen, Jesse

Tuma, Michael (SWCA Environmental Consultants) and Ryan Glenn

[102] *Analysis of Vertebrate Faunal Remains from the San Gabriel Mission Archaeological Site*

We assessed subsistence practices, animal husbandry and butchery practices, livestock industry and trade, and variations in cultural foodways for Native American and Euroamerican inhabitants of the San Gabriel Mission Site during the Mission and American Periods. We addressed these research themes with the recovery, identification, analysis, and interpretation of extensive faunal remains from the Bishop's Garden portion of the site. Our faunal analysis focused on two features: a Mission Period midden situated near the neophyte living area, and an American Period trash deposit associated with a later Euroamerican occupation. We identified the vertebrate faunal remains and examined them for butchering, burning, and other cultural and natural taphonomies. Species represented in these assemblages included cow, sheep, dog, goat, horse, deer, chicken, rabbit, and,

in smaller quantities, several species of birds and fish. A preponderance of domesticated species from the millrace, particularly cow and sheep, coincides with our understanding of the lucrative tallow and hide industry at the California missions during the Mission Period. The recovery of wild species suggests that the Native American neophytes continued traditional subsistence practices to an extent. The American Period midden was dominated by domestic dog, chicken, and pig, indicating a wholesale shift in subsistence economy.

Tun Ayora, Gabriel [78] see Ringle, William

Tung, Burcu (University of California, Merced), Arzu Demirergi (Stony Brook University), Duygu Tarkan (Istanbul University) and Camilla Mazzucato (University of Oxford)
[32] *Sharing and Neighborhoods: Assembling Social Ties at Neolithic Çatalhöyük*

Recent interpretations of archaeological data from the Neolithic Çatalhöyük show a complex network of interactions between the Neolithic inhabitants of the site to the archaeological households, neighborhoods, and the surrounding landscape. In this entanglement, it has been difficult to overtly assess the rise of the 'autonomous' household within the sequence of the Neolithic occupation. Neolithic practices of "sharing" indeed make a messy archaeological puzzle to decipher in terms of understanding control mechanisms tied to specific households, neighborhoods, or production means. Drawing on Latour's ANT and Raffles' expression of intimate knowledge, we argue that the practice of "sharing" is intimately tied to the production of knowledge. This intimate knowledge expresses referential and embodied aspects of knowledge construction, born through the interaction between people to things, people to people and people to places. Because intimate knowledge incorporates shared knowledge, it provides a basis on which to move back and forth between the different levels of interaction where knowledge construction takes place. We demonstrate, through use of different archaeological assemblages such as building materials, pottery, faunal and archaeobotanical remains that "sharing" occurred in different scales that relate to household-based ties, neighborhoods as well as and inter-communal ties.

Tung, Tiffiny (Vanderbilt University, Department of Anthropology)

[132] *The Wari Empire: What We Have Learned from Bioarchaeological Analysis of Wari Skeletons*
Knowledge about the Wari Empire in the central Andes of Peru has grown immensely in the last decade, in large part because of the Conchopata Archaeological Project, directed by Isbell and Cook. That work, and our current understandings about Wari, developed out of the previous four decades of research by Isbell (and others). In this paper, I build on those previous finding and synthesize new and already published bioarchaeological data from Wari heartland populations, focusing on how information on demography, trauma, and diet provide insights into the social and political organization in the imperial core. Demographic profiles show an unequal sex distribution, and trauma data show that both men and women were victims of violence, though non-local men and children were victims of violence at a higher frequency than were locals. New data on dental disease, combined with previously published stable isotope data, reveal a maize-based diet, a valued crop produced under the auspices of the Wari state. I also explore how these findings support and refute ideas that Isbell has put forth over the years, showing the great impact that Isbell's scholarship has had on our understandings about the Wari state and Wari society.

Turner, Grace (The College of William and Mary)

[115] *An Allegory for Life: Transforming the Bahamas*
W.E.B. Dubois' reference to worlds 'within and without the veil' is

the narrative used for interpreting this 18th-19th century African-Bahamian urban cemetery. People of African descent lived what Dubois termed a 'double consciousness.' This research examined material expressions of the cemetery landscape aiming to understand how these represent the cultural perspective of affiliated communities. Changes in the maintenance of such a cultural landscape should be archaeologically visible. Analysis included human remains but also the cultural preference for cemetery space near water; specific trees planted as living grave site memorials; butchered animal remains as evidence of food offerings; and placement of personal dishes atop graves. Ceramic and glass manufacture dates suggest this African-derived cultural behavior was no longer practiced after the mid-19th century although the cemetery was used until the early 20th century. This change I interpreted as evidence of conscious cultural decisions by this population to eliminate obviously African-derived expressions of cultural identity. Motivation for this shift I suggest was desire for social mobility. Full emancipation in the British Empire came by 1840. It appears that for African-descended people to be upwardly mobile in the dominant society they had to reject public expressions of an African-derived cultural identity.

Tuross, Noreen [114] see Campana, Michael

Tuross, Noreen (Harvard University), Sergio Lopez (Instituto Nacional de Antropología e Historia), Richard Waldbauer (Harvard University) and Nelly Robles Garcia (Instituto Nacional de Antropología e Historia)

[159] *The Antiquity, Subsistence, and Home Range of the People Placed in Tomb 7 at Monte Albán*
Tomb 7 at Monte Albán World Heritage Site in Mexico was excavated in 1932 by Alfonso Caso (Caso, 1968). A remarkable collection of goods that demonstrated a high level of craftsmanship and artistry and control of multiple materials were found in the tomb. Tomb 7 also contained skeletal elements from a number of individuals (Barbolla, 1968), but while there was no single complete skeleton, there was an unusual distribution of anatomical elements. We have obtained 49 radiocarbon dates from skeletal elements in Tomb 7, including three carnivores found in association with the human remains. Two samples date to the time of the tomb construction in the Postclassic, and the remaining dates cluster between approximately A.D. 1200 and 1400. We suggest that the taphonomic preservation, the distribution of radiocarbon dates, and the ranges in carbon, nitrogen, hydrogen and oxygen isotopes of bone and tooth collagen support an interpretation of ongoing use of Tomb 7 by a number of people originating from a wide geographical range in the Valley of Oaxaca.

Tushingham, Shannon (University of California, Davis), Jelmer Eerkens (University of California, Davis), Dominique Ardura (Fiehn Metabolomics Laboratory, UC Davis Genome Cen), Mine Palazoglu (Fiehn Metabolomics Laboratory, UC Davis Genome Cen) and Oliver Fiehn (Fiehn Metabolomics Laboratory, UC Davis Genome Cen)

[124] *Chemical Evidence for Hunter-Gatherer Tobacco Smoking in Ancient Western North America*

Evidence of the prehistoric use of tobacco (*Nicotiana* sp.) by hunter-gatherers has remained elusive. Lacking tobacco seed preservation, the presence of distinctive biomarkers in pipe residues is the most promising route for tracing ancient tobacco use. GC-MS chemical analysis of residue extracted from stone pipes and pipe fragments excavated at sites in the southern Pacific Northwest Coast of North America and California demonstrate that hunter-gatherers smoked tobacco by at least the 9th millennium AD and continuing into the historic period. Non-farming ethno-historic Native Americans throughout the west gathered and sometimes cultivated tobacco for ritual and religious purposes, but until now the antiquity of the practice on this part of the continent was unknown. Method validation includes chemical

characterization of a suite of smoke plants and experimental reproduction of "smoked" pipe chemistry. Results indicate biomarkers are traceable for several species commonly smoked by ethnographic native peoples, including tobacco (nicotine, cotinine), tree tobacco (anabasine), and kinnikinnick (arbutin). Developed methods—where residue is extracted directly from the stone or clay matrix of whole and fragmentary archaeological pipes—may be applied in similar studies investigating the spread and use of ritual smoke plants in the ancient Americas and elsewhere.

[174] *Discussant*

Twaroski, Rebecca (Ripon College), Catherine Carabajal (Ripon College) and William Whitehead (University of Wisconsin - Fond du Lac)

[183] *Four New Ceramic Standards for Use in Archaeometry*

Four new ceramics standards are presented, characterized by handheld XRF, NAA, ICPMS, and conventional XRF, concentrating on trace elements traditionally used in archaeometric studies of ceramics. These standards have been analyzed by several independent laboratories and variations between laboratories will be presented and discussed to produce a consensus characterization profile for each standard. The four ceramic types will be commercially available earthenware, terra cotta, white ware, and a porcelain pastes will be used to produce 3 cm square by .75 cm chips in a large batch to insure lot homogeneity. These ceramic standards will be made available for free to any researchers in archaeometry who wants to calibrate or have another set of ceramic standards for their independent research projects. These standards will be NIST certified and published for archaeometry scientists to use.

Tweddale, Scott [183] see Baxter, Carey

Two Bears, Davina (Indiana University, Doctoral Student)

[169] *Colonizing Spaces of Forced Assimilation and Relocation in the Old Leupp Boarding School Historic Site*

In the early part of the 20th century, the United States government built Indian Boarding Schools across the country for the purposes of educating Native American children. On the Navajo Reservation several Indian Boarding Schools were also built, which was stipulated in the Treaty of 1868. The institutions of Indian Boarding Schools on the Navajo Reservation represent colonizing spaces of forced assimilation. Today many of the historical sites on the Navajo reservation include 20th century Indian Boarding Schools, some of which are still standing, either refurbished or condemned, as disturbed historic sites with few remaining features, and in the collective memories of Navajo people. Historic Navajo Boarding Schools contain a rich history of colonization, and this paper will focus on the Old Leupp Boarding School site in Leupp, Arizona. The Old Leupp Boarding School site not only represents an institution of forced assimilation for Navajo children, but it also a space of forced relocation for Japanese American citizens during World War II. This paper will discuss the Old Leupp Boarding School site - both in its' role as an Indian Boarding School for Navajo children, and as a Japanese Isolation Center in 1943.

Tykot, Robert (U. of South Florida)

[62] *Using pXRF for Obsidian Sourcing in the Western Mediterranean: Any Disadvantages or Limitations?*

Since the 1960s, many different methods of elemental analysis have been used successfully for obsidian sourcing in the Mediterranean. Instrumental neutron activation analysis, ICP-mass spectrometry, and several types of X-ray analysis continue to be used, including scanning electron microscopy which is limited to major/minor elements. The homogeneity of obsidian, and the

relatively modest number of sources in continental Europe and the Mediterranean islands have allowed these methods to distinguish between sources, while measuring trace elements distinguishes subsources for each. For six years, a portable XRF has also been used in this region, taking advantage of its ability to perform non-destructive analyses on thousands of artifacts in museums and excavation storage facilities when taking samples out of the country and/or performing destructive analysis is not allowed. But how can these data be compared with analyses by regular XRF and other methods? Presented here are direct comparisons of quantitative data from the same geological samples by INAA, LA-ICP-MS, ED-XRF, pXRF, and wavelength dispersive electron microprobe. Along with repeated analyses of standards, these data provide information about sample heterogeneity, instrumental precision, and detection limits, while comparison with data from other instruments raises issues concerning accuracy, especially for projects without a geological sample collection.

[253] *Discussant*

Tykot, Robert [178] see Pena, Jose

Uceda, Santiago

[164] *Huacas del Sol y de La Luna Project: Inclusion of Local and Regional Social Development*

Huacas del Sol y de la Luna is an interdisciplinary and multidisciplinary project on the north coast of Peru. It is built on a foundation of strategic alliances between public educational institutions such as Universidad Nacional de Trujillo and private businesses such as the Backus Corporation. The project's components are archaeological excavation, conservation, and the local economic development through its capacity to influence tourist activity. In this way, its activities transmit new knowledge, conservation and protection to make the site sustainable, as well as creating an adequate infrastructure to allow site visits without damage. It also sponsors media campaigns in national and international markets to heighten awareness of the tourist attraction. The development of opportunities for the local population involves working with the producers of handicrafts and the owners of restaurants in the Moche Countryside. The Project has had a direct impact on the local population with the direct creation of more than 180 new jobs and more than 500 indirect ones; at the same time the project serves as a training space for young national and international professionals in the fields of archaeology, conservation and tourism.

Uchiyama, Junzo (Research Institute for Humanity and Nature)

[258] *Investigating the Socioeconomic Contexts of Early Pottery Innovation in Jomon Japan (Honshu and Kyushu), ca. 16,500-7,500 B.P.*

In East Asia, the earliest origins of ceramic technology date back to the Older Dryas, and by the Younger Dryas, pottery use had become well established across the Japanese Archipelago. However, the general behavioral background to early ceramic innovation processes remains relatively unclear. For example, recent investigations have suggested that the socio-economic role of pottery underwent a fundamental transformation at the end of the Pleistocene, with a shift from rare and occasional use of pottery in places separated from more routine activities, towards a dramatic increase in pottery use at the start of the Holocene, and its full integration into all aspects of socio-cultural activity. This paper will examine changing patterns of pottery use within the shifting subsistence and environmental contexts at the end of the Pleistocene, focusing on several sites of the Incipient-Initial phases of the Jomon period in the western part of Honshu and southern Kyushu. It concludes that full-scale integration of pottery into Jomon lifeways was accompanied by a coeval process of economic diversification, involving a greater focus on fishing, and increasing sedentism.

Ullah, Isaac (Arizona State University, SHESC) and C. Michael Barton (Arizona State University, SHESC, CSDC)

[23]

Simulating "Collapse": A Computational Modeling Approach to Understanding Adaptive Reorganization in Low-Level Socio-Natural Systems

Societal "collapse" is a hot-button issue that has recently been the subject of several popular books. Much argument exists as to whether societies actually do collapse, and almost all of the attention has focused on later instances of "collapse" in complex civilizations. In this paper, we argue that most instances of "societal collapse" can alternatively be viewed as adaptive responses to internal and/or external changes affecting the stability of a socio-natural system. Furthermore, what can be seen as the "collapse" of one system-state can also be seen as the birth of another. As a case-study, we examine the transition between the Pre-Pottery Neolithic (PPN) period, and the Late Neolithic (LN) period in Southwest Asia—a transition widely held to be an early instance of societal collapse. Using the coupled ABM-GIS simulation modeling environment developed by the MedLanD project, we first conduct simulation experiments of PPN subsistence landuse to better understand potential sources of destabilization within the PPN socio-natural system. We then conduct simulation experiments of LN subsistence landuse to examine its qualities as an adaptive response to the pressures that may have destabilized the PPN system, and use these insights to critically examine the case for "collapse" at this transition.

Ulm, Sean (James Cook University), Helene Tomkins (James Cook University), Daniel Rosendahl (The University of Queensland), Lynley Wallis (Wallis Heritage Consulting) and Patrick Moss (The University of Queensland)

[2]

Last Millennium Changes in Shellfishing Behaviors across Northern Australia

Dramatic changes in shellfishing behaviors over the last 1000 years have been documented across northern Australia, marked most conspicuously by the cessation of large shell mound construction in some areas and a trajectory towards localization of resource use represented in a broadening of the subsistence base to include a wide range of shellfish taxa. Excavations reveal rapid and widespread changes in coastal site content, an increasingly diversified subsistence resource base, and patterns of increase in site establishment and use. These changes involve a localization of resource use and settlement towards a broad-based economy focused on lower-ranked resources clustered around the shoreline. Some of these changes appear to be associated with increasing climate variability over the last 1000 years, including a trend towards arid conditions associated with the transformation of coastal ecosystems and mollusc availability. Shellfish appear to have played a key role in evening out irregularities in these patchy and variable environments over the last millennium, underwriting the successful late Holocene colonization of islands across the northern Australian coastline and in the reorganization of shellfishing behaviors towards more intensive shellfishing beginning around 800 years ago.

Umetsu, Kazuo [194] see Adachi, Noboru

Underhill, Anne (Yale University)

[65]

Processes of Site Abandonment in Ancient China: Some Proposed New Directions for Research

Site abandonment is not a topic that has been widely addressed with respect to ancient China. This presentation makes an argument for a broader approach to the process of abandonment by focusing on perceived benefits from expanding networks of social relations, rather than response to external disruptive factors. It considers why people chose to abandon some settlements in favor of others as urbanization occurred in more than one region.

propose more than one kind of change in social and economic relations as nucleation of population took place along with a corresponding detachment from other settlements.

[164] *Chair*

Unruh, David and Meaghan Trowbridge

[85]

Multicomponent Sites along the U.S. Highway 491 Corridor, from Twin Lakes to Sheep Springs: Basketmaker III through Pueblo III

Due to a proposed reconstruction of U.S. Highway 491 in McKinley and San Juan counties in New Mexico, Statistical Research, Inc. undertook data recovery operations on 26 archaeological sites. Cultural components recognized on the sites span the Early Archaic through Pueblo IV periods and also include a historic Navajo presence. Excavated sites range from isolated features and small low-density artifact scatters to large habitations with multiple roomblocks and pit structures. Several large habitation sites contain multiple occupations, displaying the continuum of architectural and technological change from Basketmaker III through Pueblo II-III and on into historic Navajo times; these sites hold potential to further address long-standing questions concerning cultural history and dynamic processes affecting prehistoric peoples living in the San Juan Basin. Here, we present preliminary results of selected multicomponent sites excavated during 2011 and 2012 in the context of previous work in this area.

Uomini, Natalie (University of Liverpool)

[11]

Right-Handedness in Paleolithic Hominins: Results from Aa3D Laser-Scanning Study of Flint Flakes

Language may be unique to humans, yet its origins and evolution remain unclear. Many language-origin theories and hypotheses have been proposed by linguists, computer scientists, primatologists, and anthropologists, but archaeologists have rarely been consulted in the formulation of these theories. Archaeological evidence for language occurs in various time periods and places. In particular, data on right-handedness in fossil hominins have been used to infer language capacity. This paper will present a brief summary of archaeological data for handedness in past populations, followed by new results from a 3D laser-scanning project on stone flakes. The project aimed to compare handedness patterns in several Paleolithic collections (including Beeches Pit, UK; Purfleet, UK; Payre, France; and Quneitra, Israel) by measuring the angle of the bulb of percussion relative to the platform, which indicates the knapper's hand preference. This evidence will be combined with primatological, ethnographic, and paleoanthropological data to explore the origins of one of humanity's strangest features.

Urban, Tomislav [10] see Barr, William

Urban, Patricia (Kenyon College) and Edward Schortman (Kenyon College)

[140]

Politics by Design: Performing Power through the Manipulation of Ceramic Designs in the Naco Valley, Northwestern Honduras

Would-be rulers everywhere must devise means to be part of the group they seek to lead even as they distinguish themselves from their followers. Failure to achieve the first aim disassociates elites from the social networks through which assets crucial to achieving and legitimizing preeminence are secured. Inability to accomplish the second objective undermines the creation of hierarchy with notables ensconced at the top. Resolving this universal conundrum involves mobilizing conceptual and tangible resources through shifting patterns of alliances. The resulting power relations are often unstable, the majority retaining assets with which to challenge and limit the aspirations of their presumptive rulers. Describing political structures thus requires specifying what

resources were used to achieve power and how, and how successfully, they were marshaled in pursuit of that aim. In this paper we consider how elites manipulated foreign and local symbols emblazoned on ceramic vessels in their efforts to create a unified polity in the Naco valley, northwestern Honduras during the 14th-16th centuries AD. The relevance of these strategies to understanding processes of political change generally are reviewed as are the broad lessons to be learned from the very limited success Naco's elites enjoyed in creating hierarchies and centralizing power.

Urban, Thomas (University of Oxford), Kevin Smith (Brown University) and Susan Herringer (Brown University)

[189] *Geochemically Tracking the Earliest European Explorers in North America: Investigations of a New Jasper Fire-Starter from L'Anse aux Meadows, Newfoundland*

In 2008, a red jasper fire-starter fragment was recovered at the site of L'Anse aux Meadows, Newfoundland, during Parks Canada's investigations of features north Hall F of, the largest of the turf-walled longhouses Norse explorers built at this site, ca. AD 1000. This unexpected find brings the number of red jasper fire-starter spalls from this site to eleven. Ten others have previously been examined using Instrumental Neutron Activation Analysis to identify source areas for the stone and, by implication, areas from which L'Anse aux Meadows' Norse visitors came or to which they sailed from the site. INAA suggested that half of the previously known jasper objects from L'Anse aux Meadows were Icelandic, four others came from Western Greenland, and one was from a distant part of Newfoundland. In 2011-12, we examined the new fire-starter fragment and a suite of geologically sourced jasper samples from the North Atlantic using non-destructive pXRF. This poster establishes the archaeological context of this most recently recovered object, documents its use as a Norse fire-starter, examines the use of pXRF to identify a possible source area for this object, and explores its implications for tracking the travels of the first European explorers of North America.

Ure, Scott (Brigham Young University)

[139] *Parowan Valley Potters: Examining Technological Style in Fremont Snake Valley Corrugated Pottery Produced in the Parowan Valley, Utah*

Defining the Fremont archaeological culture has challenged archaeologists for decades. There is still considerable debate about the origins of the Fremont, their eventual demise, their genetic relationship to modern Native American tribes, and a myriad other issues. In nearly a century of Fremont research, socio-political, economic, and religious complexity remain elusive subjects. Examining technological style, the manifestation of socially influenced choices during each step of production as a means of passive and active communication, is one useful avenue to examine Fremont material culture to uncover the social patterns they may, or may not, contain. In this paper I examine whether or not technological style in Fremont Snake Valley corrugated pottery holds traces of social identity produced by Fremont potters living in the Parowan Valley, Utah.

Ure, Scott [175] see Richards, Katie

Uribe, Mauricio

[285] *A Long Formative at Tarapacá: Social Evolution and Complexity in Northern Chile (400 B.C.-A.D. 900)*

Although the chronological and evolutionary values of the Formative period have been questioned, it is still viewed as a direct correlate of the European Neolithic. While we recognize the existence of formative processes with different dates and cultural characteristics, the Formative period in the Norte Grande region has been built under this paradigm, defined by innovative elements that marginalize ancestral archaic traditions, promoting

explosive economic and social transformations associated with the development of agriculture and the influence of external populations. Based on the findings of this project, we evaluate the empirical and theoretical basis of the concept of Formative, through the specific case of Tarapacá. In particular, we present new environmental, architectonic, artifactual and iconographic data obtained through four years of research in emblematic sites of Chilean archaeology, localized on the coast, Pampa del Tamarugal and the highlands of Tarapacá. At the same time, we share our ideas about the connotations that could have guided the evolution of these societies and their growing complexity towards later times; where the Formative period did not necessarily represent an ideal of progress, but the particular expression of a universal and tragic human condition: the distinction between nature and culture.

Urton, Gary (Harvard University)

[132] *What Are the Traces of "Administration" In Wari Material Remains?*

This paper begins with a brief overview of what we have learned over the past few years about the potentialities of Wari record keeping from close study of the few remaining samples of Wari khipus. Working on the presumption that Wari khipus were tools of administration, and without the benefit of chroniclers' narrative accounts (as with the Inka) giving us insights into the nature of Wari administration, this paper explores what we can deduce about Wari administrative structures and procedures from study of Wari material remains, focusing on textiles, architecture and settlement patterns. It is argued that Bill Isbell's studies of Wari archaeological remains (especially settlement studies) are central contributions to beginning to define central features and processes of a Wari form of administration. The analysis focuses on asymmetry, recursive hierarchies, compartmentalization, and quantitative heterogeneity (i.e., an apparent absence of a unified, organizing numerical principle) as some of the central values, or attributes, of Wari administrative structures.

[166] *Discussant*

Uruñuela, Gabriela [63] see Plunket, Patricia

Usik, Vitaly [207] see Nigst, Philip

Ussher, Ella (Australian National University), Alex Pryor (University of Cambridge) and Matthew Prebble (Australian National University)

[274] *Development of an Accessible Parenchyma Comparative Collection for the Pacific and beyond*

To date, macro-botanical analysis in the Pacific has been dominated by the study of wood charcoal and seeds. Recent archaeological investigations in Tonga and Palau have attempted the recovery of another macro-fossil that can provide direct evidence for agriculture in these archipelagos. Parenchyma is a general term for the cellular tissue that provides structural support for plant organs, and 'vegetative storage parenchyma' refers to cellular tissues that form within the roots and tubers of plants. Subsistence practices in the Pacific are dominated by the cultivation of these starchy cultigens, such as varieties of taro (e.g. Alocasia macrorrhiza, Colocasia esculenta, Cyrtosperma merkusii, and Xanthosoma sagittifolium), sweet potato (*Ipomoea batatas*), yams (*Dioscorea* spp.), bananas (*Musa* spp.) and breadfruit (*Artocarpus* spp.). The construction of a comprehensive comparative collection is an essential step towards enabling the identification of these macro-botanical remains. In this study, a range of economic plants collected from Fiji, Tonga, and Palau will be analyzed using both Scanning Electron Microscopy (SEM) and histological thin sections. This data will then be incorporated into a larger global database that will be accessible online and searchable by morphological attributes and geography. Future research will also involve experimentation with differential charring

conditions and fracturing techniques.

Uyeoka, Kelley (Kumupa'a)

[203] *Discussant*

Vaiglova, Petra (University of Oxford), Amy Bogaard (University of Oxford), Armelle Gardeisen (Université de Montpellier) and Rebecca Fraser (University of Oxford)

[83] *Agricultural Management in Neolithic Kourphovouno, Southern Greece: Results of Combining Stable Isotopes of Plants and Animals*

The intensity of crop cultivation and animal husbandry sheds light on the nature of ancient agricultural economy. In this case study, a combination of plant and animal stable isotope values ($\delta^{13}\text{C}$ and $\delta^{15}\text{N}$) is used to infer the crop growing conditions and feeding practices of a wide range of domestic plants and animals dating to the Middle-Late Neolithic phases in Kourphovouno, southern Greece. This innovative method demonstrates the potential of stable isotopes to inform our understanding of farming practices such as crop water management, application of manure and whether certain domestic crops were being grown as animal fodder. The results provide direct evidence for addressing issues of scale, consistency and stability of the agricultural system. The results indicate, among other things, that the two main cereal crops grown in Kourphovouno (free-threshing wheat and hulled barley) were cultivated separately and under different labor-intensities. In combination with results from bioarchaeological and palaeoenvironmental studies, this approach proves useful for inferring the symbiotic relationship between domestic plant and animal resource management and placing the subsistence economy in its cultural context.

Valadez, Raúl (Instituto de Investigaciones Antropológicas) and Bernardo Rodríguez (Instituto de Investigaciones Antropológicas)

[20] *The Dog and Mesoamerican Civilization: Analysis and Contrast between Traditionally Anthropological Thought and Actual Scientific Knowledge*

Since Mexican anthropology began a century ago, the importance of the dog in the mesoamerican civilization was noticed. During more than a century, every concept about this animal was based on codex and colonial texts which brought in consequence limited, static and sometimes false information, forming the classic vision of its usage as companion of the dead, food and the presence of three different types. Since 1989 the study of the mesoamerican dog began, based mainly in the zooarchaeological investigation, this has allowed to create an amplified, renewed and scientific backed-up view about that epoch dog-man relationship. Thanks to this developed studies and methodologies, at this moment is possible to recognize at least 20 different schedules of use, six types of these animals, and the possibility to determine dimensions, sex, age, type and feeding pattern in the archaeological samples.

Valadez Azúa, Raúl [234] see Zurita-Noguera, Judith

Valcarce, Ramon and Carlos Rodriguez-Rellan (Fulbright Scholar ASU (Az))

[51] *Being There: Some Remarks on the Location Patterns of NW Spain Prehistoric Rock Art*

Several thousand rock outcrops are known to have been carved in NW Iberia, most of them along the local Copper Age (3rd millennium B.C.); the images displayed are largely non-figurative (usually circular combinations) but a number of them show images of zoomorphs or weapons, too. In the last 20 years their spatial setting has been analyzed and the petroglyphs were often thought

of as references in the landscape, associated with the control of certain resource-rich areas or the routes leading into them.

That kind of interpretations did not pay enough attention to the existence of several factors that could have modulated the interaction between the rock art and the surrounding landscape, namely the variable perceptibility of the decorated panels, itself depending, among other things, on the size and inclination of the rock. By those means, the number and nature of the actual observers might have been managed and also the kind of message conveyed. With this hypothesis in mind, we have carried out surveys in some areas and the results are assessed by means of GIS analysis.

[51] *Chair*

Valcarcel, Roberto (CISTAT, Holguin) and Menno Hoogland (Leiden University)

[292] *Early Colonial Interaction in Cuba: The "Indio" Identity*

The Spanish conquest and colonization of the Antilles both represented an act of appropriation of spaces, resources and peoples as well as a transformation of the identities of the human collectivities involved, especially those of the conquered ones. The colonization of the life and spirit of these peoples not only destroyed their indigenous life but also resulted in the construction of a new being, the "indio", which replaced the diverse ethnic identities and created a new colonial subject. Research at El Chorro de Maíta, in Cuba, reveals the mechanisms that led to the creation of the "indio" on the basis of the transformation of the appearance of the individuals and the replacement of their cultural practices and religious systems. The elite and the underclass were at the center of this process, which provided a platform for the eventual conformation of the indigenous heritage left by the societies of the region. It is clear that the "indios" were not only a stratum of diverse origins but also with multiple social statuses which were inserted in the new webs of pan-regional interactions that were created by Europeans as part of their colonial domination.

Valcárcel Rojas, Roberto [254] see Weston, Darlene

Valdes, Paul (School of Geographical Sciences, University of Bristol), Masa Kageyama (Laboratoire des Sciences du Climat et de l'Environnement) and Ariane Burke (Dept. d'anthropologie, Université de Montréal)

[215] *Modeling Climate Variability and the Impact on the Iberian Peninsula*

Climate model simulations are increasingly being used to help untangle the complex interplay between climate and humans. However, climate models are imperfect tools at simulating past environmental conditions. We present some new results comparing two different climate models of the Last Glacial Maximum and periods during STAGE3. By comparing the two models we can better quantify the uncertainty in the simulations. We identify key significant differences in climate variables (or variability) arising for the Iberian Peninsula and test whether these differences result in significant changes in the results of a spatial analysis of climate and humans using the distribution of archaeological sites.

Valdez, Velma (Yakama Nation)

[246] *Discussant*

Valentin, Frédérique [27] see Herrscher, Estelle

Valentine, Benjamin (University of Florida) and John Krigbaum (University of Florida)

[219]

Aridity, Residence, and Resource Use: Stable Isotope Data From Indus Civilization Human Remains

Light stable isotope data from South Asian archaeological human tooth enamel suggest a diversity of responses to climate change within the Indus Civilization cultural tradition. Samples from the site of Farmana (n=35) dating to the Mature Harappan phase (ca. 2600-1900 B.C.) and the site of Sanauli (n=66) dating to the Late Harappan phase (ca. 1900-1300 B.C.) offer a diachronic perspective on the Indus phenomenon that suggests a trend for decreasing precipitation. The eastward shift in settlement patterning that occurred during the Late Harappan has been interpreted as a migration away from arid zones towards the wetter precipitation regimes of the Gangetic river system. Stable oxygen isotope ratios ($\delta^{18}\text{O}$) reported here support this interpretation, with a mean $\delta^{18}\text{O}$ value of $-3.4 \pm 0.8\text{\textperthousand}$ at Farmana and a mean $\delta^{18}\text{O}$ value of $-4.4 \pm 0.8\text{\textperthousand}$ at Sanauli ca. 90km to the east. Further, a comparison of the mean $\delta^{13}\text{C}$ at Farmana of $-10.0 \pm 1.1\text{\textperthousand}$ with that from Sanauli at $-12.0 \pm 0.7\text{\textperthousand}$ is consistent with the scenario that Farmana inhabitants exploited a broader range of food resources during a period of increased water stress.

Valentine, Benjamin [260] see Krigbaum, John

Valenzuela, Leslie

[26]

Projectile Points as Symbols during the Late Archaic in the Central Coast of Peru (3000-1500 cal B.C.): Origin, Technology, and Use of a Lithic Find in Cerro Lampay

The Late Archaic period in the Central Coast of Peru is characterized by a new social order that is evidenced, among other things, in monumental architecture. The groups that inhabited the region at the time practiced fishing, gathering and incipient agriculture. In this context, lithic technology is rare, and is mostly known for its barely modified flakes. Thus, the unique discovery of eight projectile points at the architectural complex of Cerro Lampay, suggests questions about their origins, and the reasons for their manufacture and use. The points are not only rare, but their deposition –wrapped in cotton, as part of the ritual abandonment of this architectural complex–, is notable. An earlier cursory technological analysis revealed that the points were made by individuals that were neither familiar nor knowledgeable of this type of technology. However, a new study regarding these points' source, production ("chaîne opératoire") and use, challenge this idea, and allows us to address questions concerning their origin, probable place of manufacture, and use before their burial.

Vallières, Claudine (University of Florida)

[136]

Chez Mollo Kontu: Eating and Hosting in Domestic Contexts at the Ancient Urban Center of Tiwanaku, Bolivia

Archaeological investigations of the social aspects of foodways can reveal clues to the political and symbolic roles of food in contexts beyond large-scale feasting events. This paper presents results of the faunal analysis from Mollo Kontu's domestic contexts, a neighborhood in the ancient urban center of Tiwanaku, and incorporates data from previous and ongoing studies of plant, fish, ceramics and human remains to recreate past domestic foodways within this sector of the cosmopolitan capital. The picture of daily life at Mollo Kontu thus painted reveals how the complex relationship between Mollo Kontu and the greater Tiwanaku polity was negotiated and embodied through food practices of its residents. These practices speak of more than accessibility of food resources and their procurement by Mollo Kontu's residents; they reveal their food preferences, meal preparation techniques and choices in the use of serving and cooking wares. At Mollo Kontu, Tiwanaku ceramics emblematic of the state were manipulated within the private sphere of daily consumption and household-level hospitality to subtly express dissension from state-wide identity through what was served in them. Meals and beverages served and consumed in Tiwanaku

vessels expressed a staunchly local identity for Mollo Kontu residents living within the cosmopolitan center.

[136] *Chair*

Van Der Leeuw, Sander (SHESC)

[23]

Discussant

[23] *Chair*

van Duijvenbode, Anne [254] see Hoogland, Menno

Van Gijn, Annelou (Leiden University)

[227]

A Biographical Study of Middle and Late Neolithic Amber, Jet, and Bone Ornaments: Contributions from the Microscope

Numerous beads and pendants of amber, jet and bone have been found in Dutch Middle and Late Neolithic context. In the past these finds were only described typologically. In a long-term research project, encompassing student projects, hundreds of beads from settlement and funerary context were subjected to a detailed technological and functional study. By means of experimentation and low- and high-power microscopy, production methods and sequences could be reconstructed. Microscopic analysis also revealed evidence for the method of fastening, the extent of wear and for repair or remodeling. In this paper some examples will be given of specific bead and composite necklace biographies. Also, the diachronic patterns in ornament biographies during the Middle and Late Neolithic in the Lower Rhine Basin will briefly be outlined.

[98] *Discussant*

Van Gijseghem, Hendrik (Université De Montréal) and Stefanie L. Bautista (Stanford University)

[214]

Changing Hydrological Conditions on the South Coast of Peru: Implications for Agricultural Practices and Sociopolitical Organization in the First Millennium A.D.

In the past decade various scholars have accumulated important data on past climate change for the Peruvian south coast, which indicate potential hydrological changes occurred to the landscape. Here we present archaeological data that suggest a pivotal transition occurred in agricultural practice during the Early Intermediate Period (EIP), from run-off agriculture terracing and canals toward river-bottom agriculture. These data, accumulated from the Ica Valley to the southern Nasca region using Geographical Information Systems (GIS) and survey, indicate that until some time during the EIP the climate allowed for agricultural resources to be produced by using run-off terracing in places where geomorphological conditions were appropriate. Such subsistence practices have not been used since on the south coast. These findings suggest that environmental phenomena such as ENSO events greatly impacted Nasca culture and society, marking the Early to Late Nasca period transition, which include sweeping settlement patterns changes, the development of puquio-based irrigation technologies, and the abandonment of Cahuachi as the principal ceremonial center of the southern Nasca region. Moreover, they highlight the profound and often fluctuating relationship between people and landscape.

Van Peer, Philip

[28] *Diversity and Change in Lithic Technological Organization in the Northeast African MSA*

In this paper, a number of recent analytical results with regard to the spatial organization of lithic economies as operated in the context of the Northeast African Middle Stone Age are discussed. Economic space is considered at different scales of analysis, from the site locale to the deployment of regional networks of functional nodes. The paper elaborates on the settlement model for the Nubian Complex as it was proposed a decade ago. New analyses

of the same sites used then as well as a few others allow for the chronological expansion of the model. In this context, the historical conditions of the origin of the Upper Paleolithic will be considered. The confrontation of the timing of the process with the behavioral processes at work in the domain of lithic economy leads to some surprising insights. The paper shall try to demonstrate that the construction of precise technological lineages is a necessary precondition in order to resolve the complexity of that millennia-long historic process. As far as its underlying chain of causalities is concerned, an interpretation is offered acknowledging, however, our present incapacities to empirically identify some probable core elements in that chain.

Van Tilburg, Jo Anne (Cotsen Institute of Archaeology at UCLA) and Cristián Arévalo Pakarati (Easter Island Statue Project)

[164] *Seeking Solutions: An Archaeological Approach to Conservation of a Threatened Heritage on Easter Island (Rapa Nui)*
 The Easter Island Statue Project (EISP) encompasses a range of resources to clarify the social role of monolithic statues (moai) on Easter Island (Rapa Nui). This paper summarizes our scientific mapping, excavation, and analysis procedures in Rano Raraku Intervention. Mitigation procedures on two excavated statues were conducted in association with the Centro Nacional de Conservación y Restauración, Santiago de Chile, and supported by the Site Conservation Program of the Archaeological Association of America (AIA). The statues are fundamentally infused with ancient concepts of identity and survival that resonate with contemporary issues. Diverse community actions and official decision-making structures created unique challenges for this project. The value of partnership formation and heritage conservation as best practices mitigating site destruction caused by macro environmental conditions and unprecedented levels of tourism are explored. Ethics and values clarification, as well as intellectual property rights in the digital age, legitimate entrepreneurial interests, and economic sustainability in the modern era are examined.

Van Vlack, Hannah, Cyler Conrad (University of Washington), Ben Marwick (University of Washington), Cholawit Thongcharoenchaikit (National Science Museum, Thailand) and Rasmi Shoocongdej (Silpakorn University, Thailand)

[7] *Zooarchaeology and Human Ecology at Khao Toh Chong, Krabi, Thailand*
 Khao Toh Chong Rockshelter in Krabi, Thailand has a well preserved and stratified record of archaeological material. Previous geoarchaeological analyses have indicated that the rockshelter has an undisturbed record of sedimentation and cultural occupation. Post-excavation analysis of this site reveals changing patterns of faunal and mollusk assemblages descending throughout stratigraphic layers. This may indicate a significant record of hunter-gatherer foraging during the late-Pleistocene to Holocene. Understanding the nature of this archaeological site will provide insight into the cultural adaptation to sea-level change through subsistence patterns. Comparisons between the faunal and mollusk assemblage will be analyzed by species and abundance to determine shifting periods of foraging diversity at the rockshelter. Periods of sea-level rise suggest a shift towards increased abundances of terrestrial and reptile species, and decreased abundances of freshwater mollusks. These results provide a detailed description of late-Pleistocene to Holocene subsistence patterns in southern Thailand.

Vandenberge, Dimitri [222] see Flas, Damien

VanderHoek, Richard

[131] *The Aniakchak Hypothesis: Considering the Ecological and Cultural Effects of Distal Volcanic Products on the Ancient North*

American Arctic and Subarctic

Since even before the 1979 publication of "Volcanic Activity and Human Ecology" archaeologists have pondered the effects that very large, high latitude volcanic eruptions have had on human populations. This topic has been continued by important recent work looking at the ecological and cultural effects of the Laacher See eruption and eruptions in Iceland and elsewhere. This paper examines the ecological and cultural effects of the 3650 B.P. eruption of the Aniakchak Volcano, located on the central Alaska Peninsula in southwest Alaska, focusing on the distal products of the eruption, particularly the effects of volcanic acid rain. Research shows that products from a very large, high sulfur eruption would have had a very deleterious effect on both ruminant health and that of lichen, a key winter forage for caribou. The Aniakchak 3460 B.P. eruption corresponds with the disappearance of the Arctic Small Tool tradition (ASTt) population in northwest and western Alaska. Research suggests that this eruption decimated key prey species of the ASTt, particularly caribou and lake fish, causing the human abandonment of a vast region.

Vanderpool, Emily [40] see Killoran, Peter

VanderVeen, James (IU South Bend) and Joshua Wells (IU South Bend)

[265] *Crowdsourcing the Past: Teaching Archaeology Students to be Active Producers of Information in a Virtual Community*

A series of introductory courses covering paleoanthropology and prehistory at a public university tested the capacity for technology-enabled active learning (TEAL) strategies to help students comprehend, retain, and actualize new information. These courses used a hybrid of online and in-person teaching and resulted in students creating, collaborating, and sharing information about the past through modern web applications and social networks. Students became comfortable in various techniques of user-generated content and interoperability. As students are already able to reach audiences far beyond the walls of the classroom, instructors must respond in kind and go beyond the use of traditional lectures, paper tests, and standard pedagogical practices. The results from the longitudinal study showed that student performance improved and engagement within the topic was higher than in typical in-person classes.

VanderVeen, James [268] see Nixon, Sarah

VanDerwarker, Amber [6] see Gracer, Allison

VanDerwarker, Amber (UCSB)

[275] *Patterns of Plant Subsistence in the Formative and Classic Sierra de los Tuxtlas: A Comparative Analysis of Macro-remains from Teotepec, La Joya, and Bezuapan*

Recent data from the site of Teotepec allow us to better define a distinctly "Tuxtlas" subsistence economy. By adding these new plant data to what we already know of La Joya and Bezuapan, it is possible to assess the level of local variation that exists within a broad regional pattern focused on a common set of plant resources: maize, palm oil, and fruits. Moreover, the preservation of maize cobs at the site of Teotepec (unprecedented in the Tuxtlas) allow us to define which varieties of maize were grown in the region during the Formative and Classic period.

[275] *Chair*

VanEssendelft, Willem

[208] *The Road More Traveled: Paths and Spatial*

Relationships in the Aztec Empire

Regional and inter-polity travel was a critical element which impacted the dominance of the Mexica in the Aztec empire. Besides the projection of military power and economic relationships, pathways between major cities may have promoted social entanglements between certain cities at the expense of others. In this way, the interaction between landscape, movements and culture could be manifested in resultant political realities for the empires central leadership at Tenochtitlan. This poster explores the routes between major concurrent urban centers in 15th century central Mexico and contrasts them with least-cost path generated computer models. The results shed light on the association between landscape and path selection in the Aztec Empire and possible mechanisms of interaction between cities which promoted the creation of complex and ever shifting political relationships.

VanGijseghem, Hendrik [138] see Kellner, Corina

VanKeuren, Scott [267] see Bender, Shilo

Varela, Selva [193] see Fondebrider, Luis

Vargas, Benjamin (SWCA Environmental Consultants)

[102] *De la ciudad (Yang-na) y la misión (Sibanga). Recent archaeological investigations at the Pueblo of Los Angeles and the Mission San Gabriel Arcángel and the greater implications for studies of culture contact in the Los Angeles Basin.*

The clash of cultures in California resulting from the intrusion of Franciscan Missionaries is a topic that has garnered much scholarly attention in recent years. From the Mission San Gabriel however, there has been scant archaeological evidence available to feed this discussion. While the study of culture contact has matured from artifact-based studies of acculturation to more sophisticated theoretical analyses, research in the Los Angeles Basin has not followed suit. In recent years there have been several projects that have provided a wealth of information related to Gabrielino/Tongva daily life outside of the missions during the contact period. To date, the missing elements in the equation have been data from the Mission proper and the secular context of the Pueblo. Recent work by SWCA in the plaza area of the Pueblo of Los Angeles and at Mission San Gabriel provide archaeological context to bolster discussions of interaction between the native Gabrielino/Tongva population and Hispanic colonists. Coupled with data from other large-scale excavations, archaeologists are afforded the opportunity to view the spheres of interaction in a more regional context. In this paper, we present early synthetic data from Mission and Pueblo contexts as a springboard for regional discussions of culture contact.

Vargas, Leticia (Centro INAH Yucatán), Victor Castillo (Centro INAH Yucatán) and Cristian Hernandez (Centro INAH Yucatán)

[160] *Los objetos de concha de Ukit Kan Lek Tok', Rey De Ek' Balam*

Como parte de las investigaciones del Proyecto Arqueológico Ek' Balam del INAH, se realizó en el año 2000 una exploración que condujo al hallazgo de la tumba del ajaw Ukit Kan Lek Tok' 2000. La cámara mortuoria estaba ubicada en un hermoso edificio convertido en mausoleo y la rica ofrenda funeraria contó con 21 vasijas y más 7 mil artefactos sumptuosos de gran belleza y admirable calidad, elaborados con diversidad de materiales como piedra verde, hueso, cerámica, piedra caliza, obsidiana, pírita e inclusive materiales poco comunes en el norte de Yucatán como las perlas y el oro, pero siendo los ornamentos de concha y caracol los más abundantes. En el 2012 nos dimos a la tarea de continuar con la investigación del material malacológico de la ofrenda y en el presente trabajo presentaremos los resultados

preliminares del análisis tipológico efectuado, precedido por la información contextual del hallazgo de la tumba y finalizando con un análisis comparativo con ofrendas similares de Mesoamérica.

Varien, Mark [67] see Powell, Shirley

Varien, Mark (Crow Canyon Archaeological Center)

[110] *Preservation Archaeology at the Crow Canyon Archaeological Center: Integrating Research, Education, and American Indian Partnerships*

Preservation Archaeology (PA) seeks to optimize the archaeological resources that remain for future exploration and discovery. As an evolving ethic, PA recognizes that to be successful it must go beyond the simple protection of sites, and include research programs that create new and meaningful knowledge about the human past and education programs that inform the public and profession about that research. As practiced at the Crow Canyon Archaeological Center, PA integrates research and education programs and partners with American Indians to design and deliver those programs. Research at Crow Canyon includes ongoing archaeological excavation, which might be seen to be at odds with PA because of the destructive nature of excavation-based research. This paper argues that PA needs to include excavation-based research because it makes a unique and essential contribution to our ongoing understanding of the human past; the new knowledge that can only be gained through excavation is one of the fundamental reasons we seek to preserve sites in the first place. The paper also argues that the stated goals of PA need to go beyond a concern for ensuring future exploration and discovery and more explicitly address how archaeology serves the society we live in today.

Varoutsikos, Bastien (Harvard Univ.), Ana Mgledadze (Free University of Tbilisi), Christine Chataigner (CNRS, France) and Manana Gabunia (National Museum, Tbilisi)

[226] *Bavra-Abzari, a Late Neolithic-Chalcolithic Rockshelter in Djavakheti, Georgia*

The Djavakheti plateau is a region that has been largely explored since the 1960s by Georgian archaeologists such as M. Gabunia. This region is particularly interesting as it constitutes one of the main pathways between the upper and the lower part of the Lesser Caucasus. Previous studies emphasized the archaeological potential of this area, from the Lower Palaeolithic to Medieval period, with a special focus on archaeological cultures of the early Holocene, but only a few archaeological projects have been initiated in the past 20 years.

The Bavra Abzari site is a rockshelter located to the south of the city of Akhalkalaki, in an area rich in mesolithic and early neolithic sites. This first (short) season of excavations uncovered 2 undisturbed layers, 1 hearth, an abundance of lithic, ceramic and a well preserved faunal assemblage. The state of preservation allowed the datations of the two layers and the earths, placing the earliest layer so far at the early 6th millennium cal. B.C. This talk will present some preliminary results, with a special focus on the lithic assemblage, and a comparison of the obsidian and dacite industry present on the site.

[226] *Chair*

Vasic, Milena (FU Berlin) and Kathryn Killackey (Killackey Illustration and Design)

[9] *Body Adornment at Çatalhöyük*

Increased material exploitation is a phenomenon seen during the Near Eastern Neolithic, including the Neolithic occupation of Çatalhöyük. The intensified production and use of items of personal adornment are some of the manifestations of various shifts witnessed during this period, indicative of the increased concern with external display and individual and communal identities. The aim of this poster is to reconstruct the external display of Çatalhöyük inhabitants by looking at the evidence for adornment across different media. Mellart's excavations and the

current Çatalhöyük Research Project yielded more than 25,000 beads made of shell, stone, copper, wood, bone, and clay, as well as other ornaments such as pins, collars, and armbands. Furthermore, textiles and traces of leather pouches have been found in several burials, as well as pigments that may have been used for colouring the textiles and for body painting. Additionally, some of the wall paintings and figurines depict hairstyles and attire. Not only does Çatalhöyük contain an abundance of ornaments and their representation, but there are also a number of inhumations containing these items in primary contexts, making this assemblage an ideal dataset for studying Neolithic external display. This data is summarized here through infographics and reconstruction illustrations.

Vasic, Milena [32] see Sadvari, Joshua

Vasil'ev, Sergei G. [222] see Izuhō, Masami

Vasquez, Josefina (Universidad San Francisco de Quito) and Iván Pazmiño (Instrumental & Optica)

[1] *Reconstruction of Site Morphology through 3D Scanning Technique: The Case of Yacuviña, Southern Ecuador*

The Inka settlement, in Southern Ecuador is under investigation, but in order to reconstruct the site lay-out, and organization, a 3D scanning process needed to be developed to overcome the lack of site visibility and preservation. Through the use of the FARO system, we have recovered detailed information that allowed us to reconstruct site organization filled with building walls, water string, canals, terraces, and other anthropogenic transformations of the landscape. We present data recovered and analyzed with those rather new technology applied to an archaeological site in Ecuador.

Vasquez, Augusto (PUCP)

[108] *Friezes at the Lurin Valley: Function, Importance, and Meaning*

In this presentation I will talk about the friezes registered at different sites of the Lurin valley during the late pre-Columbian periods. These friezes or cenefas are usually associated with patios inside domestic compounds. In the cases of the sites of Huaycan and Moye in the middle Lurin valley has been interpreted as symbolic representations of the different lunar phases. However, there is not contextual evidence or excavated evidence that could corroborate this argument. In this presentation I will address the function, importance and meaning of the cenefas of the Lurín valley in relation to a patio excavated at Panquimal's domestic sector.

Vasyukov, Mitya (A.N. Severtsov Institute of Ecology and Evolution of Russian Academy of Science) and Sarah Brown (University of California, Davis)

[71] *Dogs (*Canis lupus familiaris*) from Ancient Settlements of the Northeastern Coast of the Chukchi Peninsula, Russia*

Ancient Eskimos inhabited Chukotka, a region well known as a crossroad to adjacent regions for thousands years, and yet we still do not fully understand the role of dogs to these people nor the history of the dogs themselves. We investigated archaeofaunal remains from three ancient Eskimo settlements (Pajpelgak, Ekven and Kuniskun) and compared them to modern Chukchi dog skeletons. A total of 667 specimens (cranial and postcranial elements) of different adult dogs and 53 of juvenile dogs were measured following von den Driesch (1976). Using various osteological methods we estimated sex, age, shoulder height, weight and cranial length of dogs to document changes in paleodemography and how the dogs were used. Also we used a "tibial index" to determine if the dog was likely used for sledding or

not. Modern dogs in this region differ from ancient Eskimo dogs, and osteometric analysis indicates considerable change over the last 2300 years. Most of the ancient dogs were used as sledge dogs, but for every time period there were a small percentage of non-sledge dogs. A subsample of these dogs is currently being analyzed for ancient mitochondrial DNA.

Vaughn, Kevin (Purdue University)

[214] *It's about Time? Evaluating the Dawson Seriation in Nasca Using Luminescence Dating*

In this paper, we report on the results of an Optically Stimulated Luminescence (OSL) study on a sample of ceramics from the Southern Nasca Region that call into question some long held assumptions of Nasca chronology. Specifically, luminescence dates of sherds suggest that certain stylistic phases of the Dawson seriation are contemporaneous rather than, as has long been assumed, sequential. We discuss these results in the context of (1) recent archaeological fieldwork on the south coast of Peru, (2) dates from other techniques (especially AMS dating), and (3) the broader context of our understanding of Nasca prehistory. We suggest that our results have major implications for our understanding of the development of south coast civilizations in general and in the Nasca culture in particular. Furthermore, we call for additional sampling of ceramics in the future in order to continue evaluating long-standing chronologies used in the region.

[19] *Discussant*

Vaughn, Kevin [138] see Kellner, Corina

Vega-Gonzalez, Marina [229] see Lopez, Julieta

Velazquez, Adrian, Patricia Ochoa (Museo Nacional de Antropología-INAH), Norma Valentin (Subdirección de Laboratorios y Apoyo Académico-INA) and Belem Zúñiga (Proyecto Templo Mayor-INAH)

[248] *A Nacreous Shell Pendant from Nexpa, Morelos*

In the village of San Pablo Nexpa, Morelos, Mexico, it was found one of the oldest pieces known to the moment to the Mesoamerican cultural area. The piece is a nacreous shell pendant which has the representation of two lizards carved in high relief. It was found in a burial context dated to the Early Formative period, sub phase Early Nexpa (B.C. 1359-1250). In the present paper the results of the latest analyses made to the piece are presented, which include the biological identification of the shell and the lizards represented, as well as the manufacturing techniques used to make it (this latest due to experimental archaeology and Scanning Electron Microscopy). Aspects as the cultural affiliation of the piece, its high value and the commercial routes that made possible the circulation of prestige goods in the Formative period, are discussed based on these data.

Vellanoweth, René L. [35] see Whistler, Emily

Vellanoweth, Rene

[35] *Chair*

Venegas de la Torre, Joaquín [113] see Fernandez Souza, Lilia

Venter, Marcie (Northern Kentucky University)

[275] *After Teotepetec: Framing Intraregional Interaction in the Western Tuxtla*

After the decline of Teotepetec and other Classic period centers in the Tuxtla Mountains, considerable reorganization of settlements,

economic networks, ethnic affiliations, and political relationships occurred. Much of recent Postclassic-focused archaeological research has examined the role of external entities in this recalibration. Specific attention has been paid to how the region was integrated into the expanding Aztec Empire. In this paper, a framework for understanding Postclassic relationships within the Tuxtla is proposed. My ultimate goal is to better contextualize the Tuxtla in light of broader-scale transformations in Postclassic Mesoamerica.

Vera, Jaime (Zona Arqueológica de Monte Alban- INAH), Nelly M. Robles (Project Director) and Eduardo García (Project Archaeologist)

[114] *Un montículo Funerario en Atzompa*

Este Edificio se encuentra ubicado en el área central de la antigua ciudad prehispánica de Atzompa. Tiene un lugar privilegiado ya que al oeste se encuentra el conjunto de elite de Casa de los Altares, al sur se tiene una gran plaza ceremonial, al este encontramos un pequeño montículo y hacia el norte se encuentra el área habitacional de los antiguos gobernantes.

Este Edificio tiene forma cuadrangular. La fachada principal consta de unas escalinatas elaboradas con piedra y estuco, enmarcadas con alfardas. En la cima del edificio se levanta un pequeño templo con un piso de estuco, muros de piedra, una banqueta en la parte norte y huellas de grandes columnas. Al interior de este edificio fueron encontradas 3 cámaras funerarias con una enorme escalinata de nueve peldaños, la arquitectura encontrada es muy rica y variada. En un dos de las cámaras se encontró pintura mural al interior, donde destacan las formas geométricas y el color rojo relacionado con el inframundo. Esta tumba ha sido uno de los más grandes hallazgos arqueológicos de nuestro país y de los Valles Centrales de Oaxaca.

Verano, John [57] see Backo, Heather

Verschoof, Wouter [227] see Van Gijn, Annelou

Vesteinsson, Orri (University of Iceland)

[100] *Poverty in the Viking Age North Atlantic*

There are two contradictory narratives about the North Atlantic colonies established by Scandinavians in the 9th and 10th centuries A.D. The more traditional one sees the Faroes, Iceland and Greenland as communities of free, self-sustaining and generally affluent farmers, with poverty, inequality and exploitation only coming about in the post-Viking age as a result of the influence of the Church and foreign oppression. In this view poverty is considered incidental. The other narrative, more popular in recent years, focuses on the marginality of the North Atlantic environment, its inability to support large populations and its unsuitability for agriculture. From this point of view the very existence of these communities has seemed precarious, and explanations have been sought for why some of them survived and others did not. In this view poverty was universal in the North Atlantic.

Both of these views are flawed and in this paper I will explain why this is so. I will explore the archaeological and historical evidence for assessing poverty and wealth, drawing on comparisons between the neighboring but contrasting cases of Greenland and Iceland, and develop the argument that limitations to wealth creation may result in conditions for a relatively high quality of life.

Veth, Peter (The University of Western Australia) and Jo McDonald (University of Western Australia)

[163] *Murujuga: Rock Art and the Deep-Time Chronology of Island Formation and Emergence of Maritime Societies*

During the last Ice Age, the Dampier Archipelago was a jagged inland range more than 100km from the coast. With sea-level rise, 42 islands were formed off what is now the Pilbara coast. Most of these islands consist of extremely resistant granodiorites – which retain a permanent record of the history of human lifeways and artistic endeavour in this landscape. In this paper we will consider the repertoire of art from both proximal and outer islands adjacent the Burrup Peninsula (Murujuga) – once also the largest island in this chain. Changing art repertoires through deep time reflect the emergence of a maritime economy and society. The outer islands preserve evidence of pre-maritime and early coastal influences, while the Burrup reflects the use of this landscape as a Holocene-desert aggregation locale. We model for varying time and environmental signatures across the Archipelago and explore possible landscape variability within the recent past on the Burrup.

Vetrov, Viktor Mikhailovich [258] see Hommel, Peter

Vicari, Mary Ann [87] see Spurling, Amy

Vicari, Mary Ann (Washington University in St. Louis)

[87] *Investigating Bias in the Surface Visibility of Prehistoric Great Basin Sites*

Archaeological interpretation in the Great Basin and other desert regions often relies heavily on the assumption that surface assemblages accurately reflect overall site contents. However, many post-depositional processes result in size-sorting of assemblages: bioturbated contexts often yield disproportionate numbers of small artifacts on the surface, while eroded, argilliturbated, and trampled contexts tend to yield disproportionate numbers of large artifacts on the surface. This study investigates the effects of geomorphic and pedogenic processes on lithic artifacts from a sample of 18 prehistoric sites in eastern Nevada excavated as part of the ON Line Transmission Line Project. Lithic and geoarchaeological data from surface and sub-surface contexts were analyzed to determine the level of bias in surface archaeological manifestations in a variety of geomorphic settings. Results indicate that the majority of sites had very high subsurface to surface ratios of lithic artifacts, and that surface contexts contained disproportionately higher percentages of large artifacts. These findings suggest that surface assemblages in the Great Basin are often not representative of overall site artifact count and diversity, and that even sites situated in eroding contexts may contain large buried components. This visibility bias carries implications for analyses of site distribution patterning and regional settlement behavior.

Vietti, Laura [94] see Greer, Sean

Vigne, Jean-Denis [20] see Ollivier, Morgane

Vilchez, Carolina [59] see Moore, Jerry

Villagran, Victor (SWCA Environmental Consultants), Tiffany Newman (SWCA Environmental Consultants), Scotty Strachan (DendroLab, University of Nevada, Reno) and Franco Biondi (DendroLab, University of Nevada, Reno)

[87] *SmOLDering Coals: Dating Historic Charcoal Production in Lincoln County, Nevada*

This poster presents the findings of fieldwork conducted at an historic charcoal production site (26LN5067) located near the present-day Silver King Mine in northern Lincoln County, Nevada as part of the ON Line Transmission Line Project. Excavations revealed multiple episodes of site use, dating from prehistoric through modern periods, with the largest component consisting of numerous historical charcoal platforms, axe-cut trees and diffuse historic artifacts. Dendrochronological analysis on carbonized wood collected from within the charcoal platforms yields dates of

1878-1879. Most historic documentation of charcoal production in eastern Nevada focuses on the Eureka Mining District, where Italian immigrants, or Carbonari, initiated charcoal production during the 1870s in response to the increased demands for cost-effective fuel used in mining operations. 26LN5067 contributes some of the earliest dates for historic charcoal production in the Silver King Pass, located southeast of Eureka.

Villagran, Victor [87] see Spurling, Amy

Villalobos, César [63] see Sugiura, Yoko

Villalpando, Elisa [97] see McGuire, Randall

Villamil, Laura [290] see Robinson, Lindsay

Villaseñor, Amelia [215] see Bobe, Rene

Villeneuve, Suzanne (Simon Fraser University), Brian Hayden (Simon Fraser University) and Desmond Peters Jr. (Ts'kw'aylaxw First Nation)

[128] *Prehistoric Sociopolitical Complexity on the Northwest Plateau*

New results from Keatley Creek document the co-evolution of residential corporate groups and ritual institutions throughout the early phases of village development (c. 2,600-1,900 and 1,900-1,600 B.P.). A new compilation of radiocarbon dates, along with specialized floor deposits, feasting evidence, prestige items and new approaches in the detailed excavation and analysis of housepit deposits provide a revised occupation history for the site and timing of emergent inequalities. A revised model emphasizes the early establishment of inequalities and a clear pathway to complexity with an argument for institutionalized inequalities involving visible wealth differences and religious institutions appearing before 1,600 B.P. These results can be used to evaluate resource and population pressure models as well as political (aggrandizer) models for the emergence of inequalities and political complexity.

Villeneuve, Suzanne [241] see Hayden, Brian

Vining, Benjamin (Boston University)

[166] *"Persistent Places": Long-Term Occupations in the Southern Peruvian Highlands and Their Role in Cultural Landscape Formation*

Well-developed senses of place are instrumental for many systems of symbolic and calendrical knowledge. In the Suches highlands of southern Peru, we have documented a landscape hallmarked by long periods of continuous archaeological settlement; certain loci were preferentially occupied for periods spanning millennia, while others were never utilized, resulting in a pattern of "persistent places". Persistent places contribute to historically-situated cognitive landscape constructions, including ambivalent and instrumental attitudes with spatio-temporal dimensions. While I do not address explicitly the role of persistent places in archaeoastronomy, they do present several implications for how ideational landscapes and similar systems of symbolic knowledge develop.

Viola, Bence

[222] *Geographic Clines in Neanderthal Morphology: The Central Asian Evidence*

Since the discovery of the Teshik-Tash child in 1936 it has been assumed that the Neanderthal geographic range extended into Central Asia. Intensive research in the region since the 1980s

significantly improved our understanding of the Middle and Upper Palaeolithic of this area, and also led to the discovery of hominin dental and postcranial remains from both Middle and Upper Palaeolithic contexts.

The remains from Obi-Rakhmat (Uzbekistan) are dentally similar to Neanderthals (Bailey et al., 2008), but their cranial morphology lacks some typical Neanderthal traits (Glantz et al., 2008). In the Altai, Krause and colleagues (2007) showed that the hominins from Okladnikov Cave are genetically closely related to European Neanderthals, while morphologically these remains don't show the autapomorphic morphology seen in Europe (Viola, 2011).

Until now, most studies of Neanderthal geographic variability focused on comparisons between Western European and Near Eastern Neanderthals (Vandermeersch, 1989; Voisin, 2006). The morphological mosaic seen in the Central Asian remains gives us a new perspective at this question.

[222] *Chair*

Viramontes, Carlos [63] see Saint-Charles Zetina, Juan Carlos

Vitousek, Peter [255] see Chadwick, Oliver

Volanski, Kaitlin [92] see Thomas, Judith

Volta, Beniamino [256] see Braswell, Geoffrey

Vommaro, Miriam [119] see Cirigliano, Natalia

von Heyking, Kristin [79] see Olsen, Karyn

Vranich, Alexei (Cotsen Institute)

[132] *Empheral Monumentality*

The monuments of Tiwanaku, Bolivia loom large in popular imagination but to date have failed to have a similar presence in the quickly developing field of Middle Horizon studies. The primary difficulty is that over-reconstructed and under-published ceremonial core is a static and monolith icon that deters alternate or more nuanced interpretations. The suggestion by William Isbell to the members of the Proyecto Arqueológico Pumapunku Akapana project (P.A.P.A.) "to find the ephemeral within the monumental" resulted in a methodology that took care to document previously ignored features and revalued and virtually relocated architecture that had been dismantled decades prior. Of particular note was the realization that the architecture ancillary to the raised platforms, while less monumental in construction and form, effectively directed movement and structured experience along the processional and primary ritual spaces, and connected the unseen sides of the structures to the rest of the site. The result was a more subtle and informed diachronic perspective on the construction and history of modification of the monuments and a reconsideration of the purpose and use of the platforms.

[61] *Discussant*

[200] *Chair*

Vroegep, Anja (Leiden University)

[292] *Worlds Alike? A History of Comparison between the Caribbean and the Pacific*

Archaeologists and anthropologists have long drawn on data and ideas from other regions to supplement their own findings, a trend which is no different between the Caribbean and the Pacific. This

presentation examines the trend of comparative research between the Caribbean and the Pacific. The results of a small online database search are presented in order to track the flow of archaeological research between the two regions, thus exposing the borrowing of information between regions. The impact of this relationship through time, or history of comparison is discussed in conjunction with the impact of 'Island Archaeology' on such comparative island studies. The Pacific, especially, has been used a source for ethnographic comparisons for many parts of the world and whilst this is less true for the Caribbean, a borrowing from findings in the Pacific is none-the-less apparent there too. The aim of this presentation is to provide a brief research history and to present an historical framework in which to understand key themes pertinent to the heritage of both distinct island regions.

Vusovic-Lucic, Zvezdana [80] see Boric, Dusan

Vuthy, Vouen [190] see Ikehara-Quebral, Rona

Wa, Ye [184] see Fox, Mathew

Wagner, Mark [117] see Zipkin, Andrew

Wagner, John (University of Colorado, Denver)

[148] *Teuchitlán: Changing Lithic Technology Strategies through a West Mexico Diaspora*
Stone artifacts and debitage distributions from the ceremonial centers of two West Mexican Teuchitlán culture sites, one occupied during the final years of the Mesoamerican Late Formative period and the other during an adjacent time span at the advent of the Early Classic period, are examined to determine changes in lithic technology strategy over a time of apparent population dispersal at the transition between the two periods (around 200 A.D.). The purpose of this study is to gain additional information about the nature of the social restructuring that accompanied the inter-site reorganization. Potential strategy differences are identified by locating differences in distribution patterns of technological and morphological lithic attributes in relation to specific features and other context details. Potential taphonomic factors are also discussed. Several potential strategies geared towards productivity, resource conservation and energy conservation are identified. Thus far, spatial distributions reveal a change towards heavy utilization of a portion of the public space for lithic production in the Early Classic public area, which itself is strategically located at a large, high quality lithic source. Possible differential utilization of space within the workshop area is also considered, which may reflect production stage or type specialization.

Wagner, Ursel (TU-Muenchen), Frances M. Hayashida (Department of Anthropology, University of New Mexi), Izumi Shimada (Department of Anthropology, Southern Illinois Univ), Werner Haeusler (Physics Department, Technical University of Munich) and Friedrich E. Wagner (Physics Department, Technical University of Munich)

[183] *A Precolumbian Copper Smelting Furnace Studied by Mössbauer Spectroscopy and X-ray Diffraction*

Copper alloy smelting on the northern coast of precolumbian Peru was done in simple pit furnaces dug into the ground of the well-ventilated workshop and with charcoal made from the local algarrobo hardwood as fuel. Copper and arsenic bearing ore and iron ore as a flux were heated with the help of blowtubes. Metallic prills and larger lumps were collected from the solidified viscous slag.

One of several charcoal-dated Middle to Late Sican furnaces found at a site on the Pampa de Chaparri situated between the adjacent Lambayeque and La Leche valleys was sampled and studied by Moessbauer spectroscopy, X-ray diffraction and X-ray

fluorescence. A slice of material was cut out of the furnace, from the top of the rear wall through the bottom to the mouth on the front and reaching about 50 mm deep into the soil. From this, samples were taken at different spots in the laboratory. The temperatures reached at different positions and depths can be inferred from Moessbauer spectra and X-ray diffractograms by comparison with laboratory firing experiments on clays from the broader Lambayeque region. Additionally, re-firing experiments were conducted using furnace samples. An emergent picture of furnace working is discussed.

Wake, Thomas (Cotsen Institute of Archaeology at UCLA)

[45] *Sitio Drago: Assessing the Effects of 600 Years of Harvesting Pressure in a Neotropical Marine Environment*

Sitio Drago, located on the northwest Caribbean coast of Bocas del Toro, Panama, was occupied between AD 800 – 1400. The 15 ha site has revealed artifacts indicating trade and exchange links throughout Lower Central America. The inhabitants of this site are assumed to be swidden agriculturalists that engaged in garden hunting and exploited a variety of marine resources. This presentation examines molluscan and marine vertebrate evidence to assess whether an estimated population of 100-300 persons detrimentally affected selected locally available marine animal species. Results indicate declines in relative frequencies of preferred mollusk species, a decline in the mean trophic level of the overall fishery, and intensification of sea turtle and manatee hunting between two distinct (early vs. late) occupation periods at the site.

[45] *Chair*

Waldbauer, Richard [159] see Tuross, Noreen

Wales, Susannah, Elizabeth A. Scholz, Chelsea B. Lewis and George T. Jones

[33] *The Effects of Reoccupation on Lithic Source Diversity in Studies of Paleoarchaic Mobility in the Great Basin*

Investigations of Paleoarchaic mobility in the central Great Basin have relied on the source provenance of stone artifacts to delimit zones of tool conveyance. In turn, these zones are thought to conform to geographic ranges through which foragers moved. To make this inference, it is assumed that the sources of raw material comprising a provenance sample represents all or a subset of all sources in use at a particular time. This assumption grows problematic when provenance samples are drawn from archaeological assemblages that may represent more than one occupation. In such cases, the sample may imply use of a home range that is unrealistically large and/or inaccurately shaped. Thus, ideally, provenance samples should represent single occupations of comparable duration. But establishing the occupation history of surface sites, which comprise so much of the Paleoarchaic record, has proven a nearly intractable problem. This study examines two sites, LPL1 and CCL5, which we suggest owe their complex spatial patterning to reoccupation. Combining spatial analyses with source provenance and technological analyses, we appraise the occupation and post-depositional history of these sites, and consider how these results encourage reconsideration of Paleoarchaic mobility patterns.

Walker, Morgan (Clarion University), Angela Goreczny (Clarion University), Sarah Kriebel (Clarion University) and Susan Prezzano (Clarion University)

[68] *Analysis of the Middle Archaic Occupations at the Millstone Site (36El0204), Elk County, Pennsylvania*

Over the past several years, Clarion University undergraduate students excavated and researched a series of Middle Archaic occupations at the Millstone site located in the Allegheny National Forest, Elk County Pennsylvania. Analysis of wood charcoal and nut fragments indicates that these Native American occupations

span from 6500-8000 BP in conventional radiocarbon years. We discuss the analysis of these Middle Archaic occupations based on the discovery of lithics, hearths, rock bed features, and roughstone tools, including a cache of net sinkers. The net sinkers—small, intentionally notched rock used to weigh down a seine—were found in a formation suggesting attachment to a net when deposited. Included are the results of archaeobotanical analysis of floral samples from hearths surrounding the net sinker cache and results from computer-generated artifact images known as polynomial texture-mapping. A synthesis of the research suggest that these components represent a series of temporary encampments by Native Americans most likely targeting resources in the adjacent Millstone creek and Clarion River.

Walker, Chester [125] see Brown, David

Walker, Dominic (University of Cambridge)

[165] *Towards a Decentered Archaeology: Archaeology Museums and Online Publics*
To date, the archaeological literature has tended to sideline the translation of decentered (collaborative, community, etc.) archaeologies in museums. Museums are increasingly adopting collaborative principles in exhibition and collections management. Moreover, many have adopted social/participatory technologies on their websites which may further challenge the authority of the discipline by allowing publics to share their knowledge with the museum. Yet, these developments raise a number of under-addressed key concerns. How successfully does decentered theory and practice translate into arenas in which the general public encounter archaeological information? How can online extra-archaeological communities challenge the authority of archaeological curators? And related to the previous concern, how does this impact upon the ability of archaeologists to talk about the past?

To help elucidate these concerns, I will present and critically assess some of the participatory technologies being utilized by museums. Further, I will establish whether extra-archaeological communities are actually afforded real authority through the use of participatory technologies, or whether online activities are considered marginal to mainstream (offline) museum activities. Ultimately, this paper contributes to debates about the nature of disciplinary expertise, in a time when archaeological knowledge is being increasingly shared, by attempting to assign a new role for archaeological 'experts'.

Walker, Danny (Wyoming State Archaeologist's Office)

[276] *Chair*

Walker Vadillo, Veronica and Xabier Armendariz (Society for Basque Studies)

[7] *A VOC Ship in the Walls of Angkor Wat?*

In 2008, while I was conducting a survey of the Angkor Archaeological Park (Cambodia) to document ship iconography in

the bas-reliefs of the temples, I found a series of boat depictions in the main entrance of Angkor Wat. The boats represented what looked like common watercraft from the Tonle Sap, without going into too much detail. Among these local boats I found a ship that looked European. After working on the image and analyzing its contents, the first impression is that the ship represented in Angkor Wat is very similar to Dutch ships from the VOC (Verenigde Oostindische Compagnie), possibly from the early 17th century. This discovery sheds new light over the dating of the paintings, which were originally thought to be from the late 19th century. This date coincides with the presence of a Japanese colony in Angkor, some of whose members left writings on the walls of Angkor Wat that have been successfully dated to this period. The connection between Japan, Angkor, and the Netherlands raises a series of questions that we will attempt to answer by analyzing the details of the ship and its historical context.

Wallace, Henry (Desert Archaeology Inc) and Michael Lindeman (Desert Archaeology, Inc)

[175] *Social Distancing, Dispersal, and Fragmentation: The 150-Year-Long Transition to the Hohokam Classic Period in the Tucson Basin of Southern Arizona*

The transition from the pre-Classic to the Classic period for the Hohokam of southern Arizona has previously been framed in terms of social responses to shifting environmental conditions, the development of new socio-political institutions, and increasingly hierarchical social organization. High resolution data from large-scale excavations and detailed surface survey in three portions of the Tucson Basin provide clues to the timing and processes involved. While climatic conditions undoubtedly played a role, the evidence points to social and ideological shifts as the prime movers in the transition. Gathering momentum over the course of the tenth and eleventh centuries, the social processes and responses to ideological change culminated in the early twelfth century in large-scale disjunctions, reorganization, and abandonment.

Waller, Kyle D. [286] see Yim, Robin

Waller, Kyle (University of Missouri-Columbia)

[286] *Intra-Cemetery Phenotypic and Mortuary Variation in the Casas Grandes Region of Chihuahua, Mexico*

The site of Paquimé is unique among North American desert west sites due to its immense size, ritual architecture, and variation in mortuary practices, which included evidence of violence, human sacrifice, and post-mortem corpse processing. Hypotheses for these practices include Mesoamerican-derived rituals, or ancestor worship. Additionally, recent mortuary research has suggested the presence of an inclusive earth/fertility cult, and an exclusive political cult. Understanding the genetic relationships between individuals who received unique mortuary treatments and the rest of the skeletal sample will help to illuminate the patterns underlying this site's mortuary practices, and the groups of individuals who engage in them. Building upon previous biostatistical analyses that have suggested sacrificed individuals may be local to the Casas Grandes region, I use use cranial and dental metric and non-metric data to seek answers to two questions. Are the individuals with evidence of post-mortem corpse processing or violence genetically distinct from individuals without, or from local individuals preceding the rise of Paquimé? Does exclusivity in the political cult reflect the presence of a few high-status lineages? This study aims to demonstrate the utility of integrating biological and osteological datasets, and the importance of integrative approaches to human skeletal remains.

[286] *Chair*

Walling, Stanley [213] see Beach, Timothy

Wallis, Lynley [2] see Ulm, Sean

Wallis, Neill (Florida Museum of Natural History) and Meggan Blessing (University of Florida)

[54] *Depositing a Suwannee Valley Feast: Feature 1 at Parnell Mound*

Eight-hundred years ago near the Suwannee River in northern Florida, groups of hunter-gatherers came together to feast and deposit a mass of fauna and other artifacts. In a large pit just north of a burial mound, a rich assemblage of fauna dominated by deer shoulders and haunches was deposited alongside large fragments of earthenware vessels, arrow points, hematite nodules, quartz crystals, and charred botanicals. While the spectacle of the feast was undoubtedly an important political event, this paper is focused on the salience of the act of deposition and the commingling of powerful substances as parts of initiatory or dedicatory inscriptions.

Walsh, Justin (Chapman University)

[13] *Self-Destruction, Recycling, and Archaeology: Recent Developments in the Space Industry and Their Consequences for the Future of the Past*

Recent trends in space mission design are likely to have enormous consequences for future archaeological research. In particular, international mandates that objects newly placed into low-Earth orbit either must be removed from orbit or lifted to a stable, higher position within 25 years of launch will have profound effects on the preservation of evidence for future study. Most missions now intend to destroy their equipment by de-orbiting it so that it burns up on re-entry. Some scientists are currently developing protocols called "design for demise" that call for satellites to leave no trace of their existence behind following de-orbit.

These new practices pose a serious dilemma for future archaeologists of technology: how to study a class of objects which are specifically intended to destroy themselves? This paper will consider some responses to this problem by making comparisons with archaeological approaches to other purposely ephemeral kinds of objects, such as the new dress given by Athenians to their statue of the goddess Athena as part of the classical Panathenaic Festival, for example, or the structures at the Shinto shrine of Isejingu, which have been ritually dismantled and rebuilt using new materials every twenty years since the seventh century CE.

Walsh, Matthew

[80] *Subsistence, Mobility, and Demographic Change at Rio Ibañez 6, Aysén Region, Patagonian Chile: A Preliminary Examination of Results from 2012/2013 Excavations*

Excavations at the stratified rockshelter, Rio Ibañez 6 (RI-6), located in the Aisén region of west central Patagonia, reveal finely-stratified occupation levels during the late-Holocene. These occupations are characterized by the faunal remains of huemul (*Hippocamelus bisulcus*) and a variety of small mammals, lithic tools and debitage produced from both local and extralocal raw materials, and hearth features. The rockshelter possesses an array of rock art, particularly consisting of assortments of negative and positive handprints. Initial investigations at the site reveal a late-Holocene presence dating to 380 ± 30 BP, but excavations in adjacent areas of the rockshelter resulted in dates in excess of 5000 B.P., illuminating the potential for much earlier occupations in the western portion of the rockshelter. In this paper, I present a brief description of the middle Rio Ibañez valley, focusing on archaeology at the RI-6 west site, and discuss preliminary results of, and implications for, the use of evolutionary ecology models to

test hypotheses about site seasonality, subsistence, mobility, and population change through time under drastically varying environmental conditions in the area over much of the last 1000 years.

Walsh, Mathew [196] see Kuenstle, Justin

Walsh, Rory (University of Oregon)

[289] *Chemical Analyses of Beakje Pottery and the Social Processes of State Formation*

Using a multi-faceted analysis to determine both the geographic origin and use history of Baekje ceramic vessels, this study investigates the relative prestige of traded goods and agricultural products. Neutron activation analysis has revealed that Baekje blackware vessels were produced throughout the region, challenging assumptions about the centralization and legitimization of power by Baekje elites. Combining this approach with analysis of residues from various vessel types will track the use of food and drink in both daily life and ritual events, as it relates to the establishment of state authority in the Baekje region. Pottery typology, ceramic trade networks, and food use combine to provide new insights on the negotiation of local identities and the nature of elite influence on production, social organization, and religious practices in the Baekje state.

[289] *Chair*

Walshaw, Sarah (Simon Fraser University)

[136] *Adopting Rice: Cultivating an Asian Crop in an African Way on Pemba Island, Tanzania, A.D. 800-1500*

On the Swahili coast of eastern Africa, mixed farming and fishing communities created Muslim trading towns that engaged with Indian Ocean cultures, materials, and values by the eighth century. Archaeobotanical data and historical evidence suggest that rice overtook African grains (sorghum, pearl millet, finger millet) by 1100 on northern Pemba, a particularly lush island off the coast of present-day Tanzania. The preference for Asian rice arguably signals a shift in cultural values towards those of the Indian Ocean merchants with whom the Swahili traded. However, macrobotanical evidence of crop processing suggests that the widespread adoption of rice was not accompanied by Arab forms of irrigation agriculture nor communal processing or central storage. The storage of rice grains in the chaff suggests minimal pre-storage processing, consistent with the household model of labour that likely provided families with millets before 1000 AD. This is significant, considering that mobilization of rice was arguably an important component of gaining and keeping power through feasting. The retention of a household production mode suggests that the Swahili valued direct access to producing food, and potentially power, and serves as an example of local agency in the strategic engagement of Indian Ocean values and practices.

Walth, Cherie (SWCA Environmental Consultants)

[27] *Social, Cultural, Biological Relatedness Based on the Skeletal Remains of Pre-Latte and Latte Period Samples from Guam*

A large number of Pre-Latte and Latte burials were excavated from Naton Beach site on Guam. This is the first site on Guam to have a large sample from the Pre-Latte period, and it offers an opportunity to examine the two skeletal samples diachronically. Can morphological and pathological characteristics of the two samples be related to social, cultural, or genetic aspects of the contributing population? To answer this research question, characteristics that may express social, cultural, or genetic aspects of the samples are examined. These include the incidence of pathologies, dental modifications, and genetic characteristics expressed in the dental metric and nonmetric data. In the population samples, yaws and spondylolysis are present in the Latte sample but not in the Pre-Latte. Labial abrasion is almost

exclusively restricted to the Pre-Latte sample, while dental incising and betel nut staining are found primarily in the Latte period sample. The Pre-Latte tooth sizes are significantly different than the Latte tooth sizes. There are 15 dental nonmetric traits that are significantly different between the two groups. The data suggest that the Pre-Latte populated Guam first with a later migration of the Latte that resulted in a replacement of cultural practices, and perhaps genetic admixture.

Walton, Alisa [147] see McCarthy, Elizabeth

Walton, Marc, Karen Trentelman (Getty Conservation Institute), Brendan Foran (Aerospace Corporation) and Apurva Mehta (Stanford Synchrotron Research Laboratory)
[253] *Characterization of Fifth Century B.C. Athenian Pottery Black Gloss Slips*

It is widely accepted that the contrasting red and black colors of Athenian fine wares produced in the 6th and 5th centuries B.C. result from cycling between oxidizing and reducing conditions during firing. This theory was largely based on ceramic replication experiments performed in the first half of the 20th century. In an effort to better understand the production technology of Athenian pottery slips, we interrogated the microstructure and chemical composition of sherds from the J. Paul Getty Museum using modern analytical techniques: x-ray fluorescence (XRF) spectroscopy, laser ablation inductively coupled mass spectrometry (LA-ICP-MS), scanning transmission electron microscopy (STEM) with focused ion beam (FIB) milling preparation, and synchrotron-based x-ray absorption spectroscopy (XAS). We have found that from the degree of vitrification of the clay phyllosilicate lamellae in the slip layer, it is possible to reconstruct the firing sequence under which the ceramic was produced. Using trace element analysis we were also able identify unique compositions for adjacent decorations, suggesting the application of different batches of clay slip. From these data we have started to develop a new model for how these vessels were being produced in the workshop, thus augmenting the archaeological understanding of this important ancient art form.

Walz, Jonathan (Rollins College)

[266] *Of Paradigms and Powerplays: Shells and Shell Artifacts in the Archaeology of Hinterland East Africa, 750–1550 C.E.*

This project begins to grapple with the socially embedded nature of African objects. I report on shells, beads of shell, and other residues excavated from central coastwise East Africa, 750–1550 C.E. In northeastern Tanzania, marine shells and locally produced beads of landsnail shell challenge extant scientific paradigms about regional political economies during the “Iron Age.” Survey and excavations at multiple archaeological sites located in the lower Pangani (Ruvu) Basin, including Kwa Mgogo and Gonja Maore, suggest that discs made from the shells of giant African landsnails played an important role in intergroup relations and regional political economies as early as the late first millennium C.E. These and other seemingly mundane objects – often ignored in site reports and interpretations of regional interactions – provide insights about craft production, exchange, and shifting political economies through time. Engaging with these objects begins to make an alternative regional past for coastwise East Africa.

[52] *Discussant*

Wambach, Thomas (University of Nevada, Las Vegas (UNLV))

[267] *Bent Out of Shape: Warping In Virgin Branch Ancestral Puebloan Ceramics*

Within the Ancestral Puebloan, Virgin Branch, region of the American Southwest, there exists a significant amount of warped bowls. While the cause of the warping is unknown, one possibility is that it resulted from accidental over-firing during the firing process. A second possibility is that they were intentionally warped

during the production process. To examine this phenomenon, experimental pit-firings were conducted to understand what factors may have caused these ceramics to warp. The results of these experimental open-pit firings on recreated Virgin Branch bowls are presented to determine if warping could have been the result of the firing process.

Wang, Fen [66] see Song, Yanbo

Wang, Fen and Shiling Yuan

[66] *Reconstructing the Food Structure of Ancient Coastal Inhabitants from Beiqian Village: Stable Isotopic Analysis of Fossil Human Bone*

The Beiqian site located in Jimo city, a few kilometers from the modern coastline was excavated in 2007, 2009 and 2011. A large number of human bones from the early Dawenkou period were unearthed. Through C and N stable isotopic analysis, the food structure of the “Beiqian” ancestors was reconstructed and the influence of terrestrial and marine resources on their lifestyle was discussed. Based on the $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ stable isotopic values of human bone collagen, the analytical results obtained through a ternary mixed model reveal that the food sources of the Beiqian ancestors included about marine species (probably shellfish and fish), C4 plants (possibly millet), and land animals. These results indicate they lived mainly from fishing and farming, supplemented by hunting or poultry raising. Compared with other sites in the same period, the stable isotope results show that 5000–6000 years ago, the lifestyles of ancestors in the Yangtze River basin, Yellow River basin, Northern coastal area and inland area were very different. The ancestors from the Yangtze River basin focused on rice farming and fishing, whereas the ancestors in the Yellow River basin farmed millet and raised animals. Those in coastal areas relied mostly on farming and marine fishing.

Wang, Qiang and Kamijyou Okamoto

[66] *Grinding Stone Tools and Subsistence Pattern in Neolithic Shandong Coast: A Case Study of the Beiqian Site*

We conducted a comprehensive study of the grinding stone tools of the Neolithic Beiqian site on the Shandong coast, China, including imitative experiments, chaine operatoire analysis, microwear analysis and starch analysis. The results not only allow us to understand the procedures of manufacturing these tools, they also provide new evidence for studying their functions as well as the subsistence patterns. The analysis suggests that these stone tools were used for both grinding nuts into flour and processing cereals. These data offer new lines of evidence for a better understanding of the subsistence patterns on the Neolithic Shandong coast.

Wang, Haicheng (University of Washington)

[179] *Bronze Typology and the Ambitions of Archaeology*

Over three decades ago, Jessica Rawson described a ritual revolution, as she called it, in the conduct of Western Zhou ancestral offerings. As she conceived it, radical changes in the ritual apparatus—bronze vessels and bells—took place in a short period of time, perhaps only a generation. Nowadays her theory is almost universally accepted as fact. But can stylistic dead reckoning have the kind of precision her argument requires? Can we really synchronize a series of steps in bronze design with a sequence of events mentioned in texts? Taking the better-documented religious revolution of the Egyptian king Akhenaten as a comparison, this paper will reexamine Rawson's arguments for sudden and coordinated change and make some suggestions about framing questions that we can reasonably expect archaeology to answer.

Wang, Youping

[179] *The Chronology of the Paleolithic in Central China*

This paper will discuss questions of chronology of the Paleolithic in Central China. Over the past 20 years, several hundreds new Paleolithic sites have been found from the southern part of Shaanxi to the central part of Henan in Central China. Ten thousands stone artifacts and other information related Pleistocene human activities were collected from those sites. The research resulted in new discoveries indicating that the pebble tool industry occupied the leading position when early human came to this region. The flake tool industry also was found, and apparently succeeded the pebble tool tradition during the middle of the Late Pleistocene, and then a blade and micro-blade industry dominated both in the cave and open air sites. A basic chronological frame has been established recently by the studies of high-resolution magnetostratigraphic investigation, OSL, AMS C14 as well as loess chronology. However, for a better understanding of both the development of lithic technology and human evolution in this region, there is still more chronological research to be done.

Ward, Drew (Georgia State University) and Terry Powis (Kennesaw State University)

[36] *Preliminary Investigations of a Late Classic Maya Granite Workshop at Pacbitun, Belize*

The Ancient Maya site of Pacbitun is centrally located between the two major ecoregions of the Belize River Valley and the Mountain Pine Ridge in West-Central Belize. In June 2012, investigations began on a group of mounds, known as the Tzib Group, located outside of the core zone of Pacbitun in order to investigate the group's potential for housing ground stone tool workshops. Excavations into Structure 1 of the group uncovered roughly 1,000 kilograms of granite debitage and scatter, as well as large quantities of mano and metate platform fragments varying in size and stage of production. In analyzing the possibility of a ground stone production center, this paper seeks to expand upon previous research at Pacbitun pertaining to resource acquisition, craft-specialization, and exchange as a result of the site's central location in the valley during the Late-Classic period (AD 600-900). Furthermore, the documentation of such a workshop will shed light on the techniques associated with the manufacture of implements essential to the possessing of the ancient Maya's staple crop, maize.

Ward, Susan [158] see Setzer, Teddi

Warden, Robert [92] see De Smet, Timothy

Ware, John and John Kantner (School of Advanced Research)

[110] *A Tale of Two Institutions: Synthesis and Publication in the Greater Southwest*

The School of Advanced Research (SAR) and the Amerind Foundation are pioneering Southwestern research institutions. In the early to mid-twentieth century SAR conducted major excavation projects in northern New Mexico, along the Rio Grande, in Chaco Canyon, and on the Pajarito Plateau. The Amerind excavated sites throughout the Southwest Borderlands, in southern Arizona, southwestern New Mexico, and northern Mexico. Both institutions curtailed major excavation efforts in the 1970s to assume new roles in the synthesis and publication of archaeological knowledge. The advanced seminar model was developed and refined by SAR in the 1970s and adopted by the Amerind in the 1980s. SAR has grown into a major publishing house while the Amerind still publishes mostly through university press partnerships. Both institutions are now experimenting with online digital publications. This paper follows the careers of two very different institutions whose missions have converged in recent years to ensure that knowledge about deep history is synthesized and disseminated. It concludes with a speculative look at the uncertain future of knowledge synthesis and scholarly

publishing.

Warinner, Christina (University of Oklahoma)

[172] *Paleopathology and Paleodiet in the Era of Metagenomics*

High-throughput sequencing has opened up dramatic new opportunities in paleopathology and paleodietary analysis. This paper explores how the emerging field of paleometagenomics is changing the way we think about ancient disease and diet and how archaeological studies can contribute to a medical understanding of health and nutrition today.

[172] *Chair*

Warnasch, Scott (NYC OCME), Christopher Rainwater (NYC OCME) and Christian Crowder (NYC OCME)

[193] *The Application of Archaeological Methods to Crime Scenes and Mass Disasters in New York City*

In the past few decades, forensic investigations have become more accurate and detailed as the tools and methods for evidence collection and analysis have increased in sophistication. However, significant gaps in the level of investigation, documentation and methodology of outdoor scenes, buried contexts and mass disasters are still prevalent. Archaeologists have been applying their unique skills to these situations for several years yet many scene investigators remain unaware or unconvinced of the practical benefits of these specialists. The anthropology unit at the New York City Office of the Chief Medical Examiner (OCME) has played a crucial role in conducting a variety of archaeology-based investigations and has made significant strides in integrating archaeologists and anthropologists into the investigation, documentation and recovery process. The archaeologist's role often goes beyond the mechanics of scene processing to include interpretation of temporal and physical contexts. The best example of the myriad applications of archaeology in a forensic context is the on-going recovery excavations at the World Trade Center site. The OCME's excavation not only demonstrated, on a large-scale, the practicality and effectiveness of archaeology, but illustrated the challenges of conducting a mass disaster recovery without the methodology, organization and perspective that properly trained archaeologists can provide.

Warner, Jacob (Louisiana State University) and David Chicoine (Louisiana State University)

[236] *Discard Patterns and Trash Flow at the Early Horizon Center of Caylán*

The disciplines of behavioral archaeology and garbology have been applied to various sites both ancient and modern in an attempt to explain the cultural practices and habitation patterns of various groups. A variety of settlement types have been studied across several continents and involving different ethnic groups. However, very few studies have been applied to South America, especially relating to the development of urban sites and social structure, despite the plethora of available archaeological sites. This poster intends to apply behavioral archaeology as well as some aspects of garbology to understanding the actual social structure and physical layout of the site of Caylán, an Early Horizon urban settlement located along the north-central Peruvian coast. Specifically, how did the settlers at Caylán dispose of their waste material, and how can we understand such patterns in relation to lifestyle and habitation practices, including the seasonality of residence at the site?

Washam, Ryan (University of Cincinnati)

[265] *Archaeology in Distress: Federal Land Management and Vulnerable Landscapes*

The Upper Basin of the south rim of the Grand Canyon presents an excellent cross-section of different federal agencies' (Grand Canyon National Park and Kaibab National Forest) approaches to land management. Though the environment and cultural

landscape are relatively similar between the two jurisdictions, different priorities lead to dissimilar land management practices. Evidence shows that divergent land management practices between agencies have profound effects on the level of disturbance across an archaeological landscape.

In order to inform the discussion of disturbances across the Upper Basin, a vulnerability study was conducted to identify areas of disruption in the archaeological record and the stressors that ultimately caused this damage. The study uses satellite remote sensing data, and GPS data, to analyze trends in ground disturbance and forest use that directly influence cases of inadvertent vandalism to archaeological sites. As a result of this analysis, a disturbance framework for the Upper Basin is presented that draws heavily from current ideas in vulnerability theory. Using this framework, conclusions can be drawn about the influence of federal land managers on archaeological disturbance.

Watamaniuk, Lelia (McMaster University)

[42] *Measuring Variation as an Indicator of Differential Stress in Bioarchaeology*
 Considerable attention has been paid to bone loss in paleopathology, but with the number of disparate methodologies used to measure bone amount, the ability of researchers to compare data from several sources is limited. This study proposes the use of the coefficient of variation (CV) as a means by which to compare different types of data more directly. The coefficient of variation is a unit-less value that shows the amount of variation in a data set. Samples with larger CVs will indicate a wider spread range of values around a mean. Large variation in bone amount values potentially indicates a differential response to, or experience of, living conditions between individuals within a group or between temporally or geographically differing groups. Four studies using different methods to assess bone amount were selected, and compared using CV values. Re-examination of this skeletal data based on CV values permitted the authors to focus on groups where bone loss occurred beyond the typical patterns of age, and to propose the use of CV to evaluate possible sources of differential stress between and among the groups studied.

[42] *Chair*

Watanabe, Yoichi [214] see Sakai, Masato

Waterhouse, Olivia (Barnard College) and Jason De León (University of Michigan)

[121] *Trying to Understand What It Feels Like to Literally Walk in Someone's Shoes: An Experimental-Ethnographic-Archaeological Approach to Migrant Shoes*
 Undocumented migrants who attempt to cross the Sonoran Desert of Arizona can often walk an upwards of 70 miles while traversing a rugged and varied terrain. People usually undertake these trips in cheaply manufactured shoes that are poorly suited for long-distance hiking. While in transit these shoes may become severely damaged and require ad hoc repairs. Moreover, migrants often sustain injuries to their feet (e.g., debilitating blisters) as a result of wearing these shoes. In this poster we present data from a phenomenological experiment on footwear conducted during the 2012 field season of the Undocumented Migration Project and a laboratory analysis of the physical properties of cheap sneakers to examine the relationship between various terrains and the resulting wear-patterns produced on footwear commonly worn by migrants. These data are then compared to ethnographic data on the embodied experiences of border crossers and use-wear data from migrant shoes recovered in the desert. We argue that our combined experimental-ethnographic-archaeological approach provides new phenomenological insight into some of the physical traumas that border crossers typically experience. In addition, this analysis of shoe use wear patterns has important implications for understanding other contemporary, historic, and ancient

migrations.

Waters, Michael (Texas A&M University)

[90] *An Examination of Clovis and Goshen Chronology*

Clovis is dated from 13,000 to 12,600 cal yr B.P. at thirteen sites scattered across North America. Four Clovis sites are reported to date to 13,600 cal yr B.P. This includes the Aubrey site, Texas, the East Wenatchee site, Washington, the Sheaman site, Wyoming, and the Casper site, Wyoming. New dating and analysis of the early dates from these four sites do not support the idea that Clovis is older than 13,000 cal yr B.P. New dates from the Mill Iron site, Montana, show that the Goshen occupation dates to 12,400 cal yr B.P. and is not contemporaneous with Clovis.

Waters-Rist, Andrea (Leiden University, Faculty of Archaeology), Vladimir I. Bazaliiskii (Department of Archaeology and Ethnography, Irkutsk), Andrzej W. Weber (Department of Anthropology, University of Alberta,), Olga I. Goriunova (Department of Archaeology and Ethnography, Irkutsk) and M. Anne Katzenberg (Department of Archaeology, University of Calgary,)

[194] *Evaluating the Biological Discontinuity Hypothesis for Mid-Holocene Populations from Cis-Baikal, Siberia, Using Dental Non-Metric Traits*

Southern Siberia has been a crossroads for human groups for millennia, resulting in complex population histories with considerable genetic admixture. This study examines the hypothesis of biological discontinuity between Early Neolithic (EN) and Late Neolithic-Bronze Age (LN-BA) populations from the Cis-Baikal, Siberia, using dental non-metric traits. Dental non-metric traits are highly heritable and evolutionarily stable and are frequently used by bioarchaeologists to investigate biological relationships between populations. It is also possible to use trait frequencies to generate hypotheses about a population's geographic origin. Different frequencies of several dental non-metric traits, significant chi-square results, and a Mean Measure of Divergence analysis, support the hypothesis that EN and LN-BA populations are genetically discontinuous. EN individuals have trait frequencies consistent with Asian (Sinodont division) populations. LN-BA individuals have several dental non-metric traits that are more similar in frequency to European groups, suggesting the population may have come from an area to the west or south of Lake Baikal. Finally, there is less variation between EN and LN-BA groups along the Angara River suggesting this as a region of possible gene flow between populations. These dental non-metric results support and supplement other measures of population affinity, including material culture, cranial morphology, and mtDNA.

Watkins, Joe (University of Oklahoma)

[141] *Spanning the Oceans: Indigenous Archaeology and Its Role in Indigenous Heritage Issues*

The acceptance of the Ainu as an indigenous population of Japan created a tacit recognition of the need to better integrate Ainu history with Japanese pre-contact history, especially in Japan's northern-most island of Hokkaido. Indigenous archaeology as it is developing globally has the possibilities of contributing to the enhanced discussion of the Ainu's relationships with the archaeological cultures as accepted in Japan as well as to contribute to strengthening the Ainu relationship with the archaeological past of the island of Hokkaido. This paper will present the changing role of Indigenous archaeology in Japan as well as the way that the Ainu can fit within other Indigenous people in archaeology's global enterprise.

[174]

Discussant

Watson, Lucía (Universidad Nacional Autónoma de Mexico)

- [29] *Rebuilding "The Necropolis of Ancon," Central Coast of Peru: New Information in the Twenty-first Century about an Excavation of the Twentieth Century*

This paper presents new information about The Necropolis of Ancon which is located on the central coast of Peru. The Necropolis of Ancon is one of the biggest and most extensive Pre-Hispanic cemeteries in the Andes. It was excavated by Julio C. Tello- Father of the Peruvian Archaeology- from 1945 to 1949, but he could not finish his task because of his death.

After a year and half of work at the National Museum of Anthropology, Archaeology and History of Peru, digitizing all of Julio C. Tello field notes, drawings and maps about his excavation in The Necropolis of Ancon, we can now put together all of this information. By these means, and using a geographic information system (GIS), we can visualize spatial distribution of the 1570 tombs and 1455 artifacts which belong to the different periods of occupation in the cemetery (from 200 b.c to 1534 A.C) and have a better idea of spatial distribution of the different cultural groups and the status of the people who used The Necropolis of Ancon.

Watson, James [218] see Harry, Karen

Wattenmaker, Patricia (University of Virginia)

- [30] *Peer Polity Dynamics and the Expansion of Bureaucracies in Third Millennium Mesopotamia*

This paper explores some of the ways that peer polity dynamics played a driving role in the formation and expansion of state bureaucracies in Upper Mesopotamia. Archaeological and textual data documenting the nature of interactions between various polities provide the basis for considering the centralized and specialized administrative infrastructure needed to establish and maintain such inter-polity relations. Particular attention is paid to the nature and timing of exchange rituals, religious ceremonies and warfare. Arguably, the unstable inter-polity relations that characterized the political landscape of third millennium Mesopotamia were embedded in, and sprang from, deeply held cosmological and religious beliefs shared by the multiple independent polities that flourished during this time.

Watts, Christopher (University of Western Ontario)

- [24] *Becoming Animal in Iroquoian Corporealities*

This paper examines the archaeological and ethnographic evidence for therianthropic change among various Iroquoian-speaking groups in the lower Great Lakes region of North America. In doing so, it highlights the consubstantiality of human and animal bodies and the extent to which passage between forms was the norm rather than the exception within Iroquoian corporealities. When considered cross-culturally, and with inputs from continental philosophy, these findings are used to argue against a view of the Iroquoian body as a fixed physiological container, as well as traditional notions of shamanism based on altered states of consciousness.

Watts, Jack [70] see Willis, Lauren

Watts, Shelley (Brigham Young University)

- [234] *Guajilar: Recovery and Burial Offerings*

A poster presenting the Maya archaeological site of Guajilar located in southern Chiapas, Mexico. Guajilar was excavated in the field seasons of 1976 by Thomas Lee, and in 1978 by John Clark and Douglas Bryant (under the direction of Thomas Lee). The poster presents unpublished excavation information and artifacts recovered from both seasons. The site was occupied

during the Preclassic Period and later again in the Late Classic and Postclassic Periods. The main features and associated artifacts consist of various burials types, offerings, and trash middens. A comparative analysis will also be made of the burial offerings between burials associated with the Preclassic and those associated with the Late and Postclassic Periods. This analysis will then be used to take a look at possible changing identities portrayed in the burial setting over time.

Wayne, Robert K. [20] see Thalmann, Olaf

Weaver, Eric [144] see Dunning, Nicholas

Weaver, Jr, Donald E. [18] see Billo, Evelyn

Weber, Andrzej [77] see Friedman, Lindsey

Weber, Andrzej

- [194] *Understanding Middle Holocene Hunter-Gatherer Diets in Cis-Baikal, Siberia, Using the IsoSource Mixing Model*

Over the last 20 years bone samples of roughly 500 middle Holocene hunter-gatherers (c. 8800–4000 cal BP) from the Cis-Baikal region, Siberia, have been tested for carbon and nitrogen stable isotope ratios in order to characterize their dietary regimes and subsistence patterns. The results, have demonstrated a substantial amount of variation both in spatial and temporal terms. The spatial variation comprises the four main micro-regions of Cis-Baikal (Angara, Lena, Little Sea and Tunka) while the chronological variation comprises differences between the three main culture-historical periods (Early and Late Neolithic, and Early Bronze Age, with the Middle Neolithic not represented in the data set). In just about every case, these vectors of spatio-temporal variation are different thus suggesting also different causal mechanisms. On the Angara the main vector of change involves a shift from a fish-game diet in the Early Neolithic to the game-fish diet in the Late Neolithic and Early Bronze Age. In the Little Sea area the main vector of variation involves the co-existence of two distinct diets (game-fish and game-fish-seal) during each period. Application of the Iso-Source mixing model to better understand this variation represents the next step in this ongoing research.

Weber, Jill (The University Museum of Archaeology and Anthropology, UPenn)

- [228] *Equid Burials at Umm el-Marra, Syria in the Mid-Third Millennium, BC: Sacrifice, Symbol, or Substitution?*

The burial of at least 30 equids in the midst of an elite, human burial complex at Umm el-Marra, Syria, is investigated. These equids have been identified as hybrids known through textual documentation to be associated with kings and gods. Their context and their identification mandates that we view their placement as part of the performance of ideology and power, as well as a document of ancestry and succession, that accompany mortuary ritual. Were they sacrifices? Did they function as symbolic statements of power and control over the populace? Were they substituted for human elites in either death or sacrifice? Variation between equid installations (burials) - in their style, numbers, inclusion of other items, and ages of equids found - suggests that equid burials could have functioned as sacrifices, symbols, and substitutions.

Weber, Martin (UC Berkeley)

- [239] *Rethinking Collapse: Crafting Post-Imperial Identities in the Early Iron Age Northern Levant*

The transition from the Late Bronze to the Iron Age in the Northern Levant (approximately 12th century B.C.E.) is commonly characterized as a classic instance of political collapse, resulting in

a radically altered economic and socio-political environment. Yet, archaeological and epigraphic data betrays a high degree of continuity in terms of architectural concepts, artistic forms and political ideologies, complicating the notion of a rapid loss of social, political and economic complexity usually associated with a state's collapse. Early Iron Age public architecture and carved stone monuments from sites in northern Syria and southern Turkey, such as Karkemish, Zincirli or Tell Ta'yinat, alternatively express the political and economic potential of these emergent political ideologies. Not only do they highlight the complicated interrelations between traditional and innovative forms of political ideology that local elites employed in order to reorganize the region within the context of deteriorating imperial control. New political ideologies were actively created in the form of a hybrid artistic program that served the specific aspirations and claims of their royal sponsors and later came to be challenged by emergent non-royal elites.

Weber, Steve

[245] *Discussant*

Webster, David [58] see French, Kirk

Webster, Laurie (University of Arizona)

[67] *Pathways to Hopi: Cultural Affiliation and the Archaeological Textile Record*

Few cultural affiliation studies in the United States have considered textiles and basketry in depth, but studies conducted for the Hopi Cultural Preservation Office have shown these classes of material culture to contribute important lines of evidence linking the Hopi people to their diverse ancestral past. In this presentation, textile and kiva mural data are used to examine evidence for Hopi ancestral connections to multiple regions and archaeological cultures of the northern and southern Southwest.

Wedding, Jeffrey (Desert Research Institute), David Smee (Desert Research Institute) and Alex Heindl (DesertWalkabouts, Inc.)

[122] *Archaeologist's Field Guide for Identifying Cold War Era Military Food Cans*

Since World War I the basic unit of food for United States military personnel in the field has been the military combat ration. The desert regions of southern Nevada, southern California, and northwestern Arizona were testing grounds for large scale, unrestricted open desert military maneuvers from World War II through the Cold War. Identification of field ration component artifacts left at military sites in this region can quickly help establish with which of these two nationally significant historical periods the sites are associated. This poster displays examples of the individual combat ration component cans from the latter Twentieth Century for purposes of providing a basic guide to distinguishing and dating the military ration cans from the Cold War period between 1947 and 1991.

Weinberg, Camille [268] see Nigra, Benjamin

Weinstein, Laurie (Western Connecticut State University) and Diane Hassan (Danbury Museum and Historical Society)

[277] *Southern New England Indians in the American Revolution*

This paper examines the context for native southern New England involvement in the Revolutionary War. Some of the questions we ask: What Natives fought in this war? Why did Indians enlist? With what kinds of communities were these men (and women) associated? And how does our research help illuminate the archaeology of Middle Encampment, a Revolutionary War site that we have been surveying, mapping, testing and excavating for the

past 8 years?

Weisler, Marshall (University of Queensland)

[255] *A Comprehensive Approach to Dating Human Colonization of Pristine Landscapes*

If there is one question that polarizes the Pacific archaeological community, then agreeing on the timing of first human colonization of pristine islands would certainly rank amongst the most contentious of issues. Sides are invariably split between "early" and "late" colonization models. This is of no small importance since the archipelagoes and islands of East Polynesia were amongst the last landfalls on Earth settled by humans with major economic, social, and political changes occurring, in some instances, over a handful of centuries. Indeed, as cogently outlined recently in *How Chiefs Became Kings* (2010), Patrick Kirch argues for a rapid and radical transformation of the Hawaiian chiefdom to a state level society during the late 16th to early 17th centuries AD after occupation of the archipelago—the largest in tropical Polynesia—for a mere 500 years or so. In this paper the chronology of leeward Molokai (Hawaiian Islands) is summarized by privileging more than 30 years of field research by the author and a comprehensive dating program with 200+ U-series and ~50 AMS radiocarbon age determinations providing a solid framework for assessing general island settlement models.

[255] *Chair*

Weisler, Marshall [263] see Lambrides, Ariana

Welch, Daniel (Texas A&M University)

[5] *Discontinuity in the Stratigraphic Record of Samoan Volcanic Glass Artifacts*

A recent archaeological study of Tongan and Samoan volcanic glass artifacts illustrates a non-integrated distribution sphere during the Ceramic Period ca. 2900-1500 BP. Current data suggest that this signals the presence of mutually exclusive intra-archipelago distribution spheres that lie in contrast with post ceramic period patterns of integrated exchange. While chronological and spatial patterns of volcanic glass distribution are becoming clearer in Tonga, refined temporal and spatial research is needed in the Samoan islands. This paper examines the stratigraphic record of volcanic glass artifacts from multi-component deposits to refine the chronology of volcanic glass distribution patterns in the Samoan Archipelago. The implications for a discontinuous record of volcanic glass procurement are discussed as it applies to hypotheses of an in-situ cultural transformation via a proto-Polynesian population.

Welch, Paul (Southern Illinois University)

[30] *Moundville's Economy, Version Two*

Generalizing from the work of Timothy Earle as well as Christopher Peebles and Susan Kus, in 1977 Henry Wright published a model of the ways producers and consumers were distributed and connected within a chiefdom economy. My 1983 dissertation tested that and other published models against data from the Moundville polity in Alabama. Finding that none of the extant models was a perfect match with the data then available, I proposed a new model tailored to fit the Moundville data. Research in and around Moundville by subsequent generations of graduate students has done to me what I did to Wright: show that the model did not fit the reality. After reviewing this history of changing understanding of the articulation between producers and consumers in the Moundville polity, I assess the impact of Wright's intellectual legacy on this branch of archaeological research.

Welch, John R. [64] see Altaha, Mark

Welch, John (Simon Fraser University), Karl Hoerig (Fort Apache Heritage Foundation), Mark Altaha (White Mountain Apache Tribe) and Ramon Riley (White Mountain Apache Tribe)

[110] *Fort Apache Heritage Foundation*

Chartered in 1998 under the Constitution of the White Mountain Apache Tribe and recognized as a nonprofit by the US Internal Revenue Service, the Fort Apache Heritage Foundation (FAHF) has the mission to create opportunities for White Mountain Apaches through the Fort Apache and Theodore Roosevelt School National Historic Landmark. Unlike organizations that measure success by achieving predetermined goals, FAHF responds dynamically to community needs and interests without compromising recognized professional standards for research or for conserving the media, objects, and structures under FAHF control. In the last decade our organization has transitioned from externally focused preservation advocacy, including litigation, to community-based programming, site management, research, and jobs creation. Current initiatives run the gamut from the removal of overhead power lines and fuel storage tanks from the historic district to leadership in creating a Western Apache Cultural Atlas and investigating the history of looting at Fort Apache. Although our mission is not archaeological per se, and history will be the judge of FAHF as a bellwether, we see many reasons for individual communities to seize leadership in determining what aspects of collective inheritance are to be carried forward and how best to do so.

[192] *Moderator*

Weller, Olivier [96] see Manolakakis, Laurence

Weller, Olivier (CNRS), Alfons Figuls (IREC - Universidad Autónoma Barcelona (SP)) and Fidel Grandia (Universidad Politécnica Superior d'Enginyeria Manr)

[147] *La primera explotación minera de sal gema en el mundo: La "Vall Salina" de Cardona (Cataluña, España)*
En este póster se hace balance de los resultados obtenidos sobre la primera explotación del mundo de sal minera desarrollada alrededor de la Muntanya de Sal de Cardona (España), la única montaña de sal gema de Europa Occidental. Se considera que esta actividad minera se inició entre 4.500-4.200 a.C. y fue una explotación a cielo abierto durante el Neolítico medio catalán. Se han analizado los procesos de producción utilizados en la Vall Salina y los procesos mecánicos que intervienen en la extracción de la sal a partir del análisis de 225 herramientas de piedra pulida. Por último, se valora los flujos de intercambios existentes durante el Neolítico medio y la importancia socio-económica de la sal gema de Cardona.

Welling, Menno [76] see Thompson, Jessica

Wells, Joshua J. [188] see Kansa, Eric

Wells, Joshua (Indiana University South Bend)

[188] *Archaeology Is Data Coding or It Is Nothing: Relationships between State and Governmental Archaeological Site File Structures and Professional Definitions through the Digital Index of North American Archaeology (DINAA)*
Governmental archaeological site files in North America are important loci for documentary information on known archaeological sites. Their most basic function is to contain data about site types and information quality pursuant to heritage preservation legislation at the federal level, but potentially state and local levels as well. However, as a matter of practice these files, often as relational databases, contain many other data fields

that describe important archaeological findings, and other data that serve environmental and bureaucratic functions for management and protection of heritage resources. The ways in which data about archaeological sites are recorded and communicated have an important origin in theoretical models about past behavior, and also have important implications on the professional comprehension of the data at large and the use of the data to rank planning and preservation priorities. The NSF-funded Digital Index of North American Archaeology (DINAA) project (involving the University of Tennessee, Indiana University South Bend, and the Alexandria Archive Institute) presents preliminary findings about how a large, contiguous area of the United States can be understood at multiple points in history and prehistory based upon the combined efforts of thousands of projects spanning decades of professional survey and excavation.

[188] *Chair*

Wells, Christian (University of South Florida)

[253] *Integrated Archaeometric Analysis of the Context and Contents of an Ulúa-style Marble Vase from the Palmaro Valley, Northwest Honduras*

Recent excavations in the Palmaro Valley of northwest Honduras uncovered a rare Ulúa-style marble vase in a residential mortuary assemblage. The find is significant, because the majority of marble vases in southern Mesoamerica come from looted collections or else were excavated before the advent of modern archaeological practices. Integrated archaeometric analysis of the context and contents of the vase reveal new insights into the use, meaning, and chronology of these objects. Analyses included: bioarchaeological assessment and multielemental stable isotope analysis (d13C, d18O, and 87Sr/86Sr) of dental enamel from the human remains using gas-ratio MS and MC-ICP-MS; pollen analysis and acid-extractable soil phosphate chemistry using molybdate colorimetry of the contents of the vase; and AMS radiocarbon dating of organic material associated with the human remains and the vase. This paper reports the results of these studies, highlighting the challenges involved in sample collection and preparation as well as quantitative analysis and interpretation of the data. Through integrated archaeometric analysis, this research makes an important contribution to understanding the role of Ulúa-style marble vases in ancient Mesoamerican societies.

Wells , Edward [276] see Harle, Michaelyn

Wendrich, Willeke [129] see Koopman, Annelies

Wendrich, Willeke (UCLA)

[129] *Chair*

Werness-Rude, Maline (Humboldt State University)

[19] *Burned, Bundled, Buried: The Substance and Context of Paracas Ceramic Offerings*

The Paracas (ca. 900 BC – AD 1) of south coastal Peru are widely recognized for ceramics bearing patterned designs created from incised clay that was often post-fire painted. Analyses of containers, effigies, figurines and musical instruments recovered intact in tombs, have largely centered on temporal and iconographic concerns, and in evaluating prestige. A number of archaeological contexts offer an alternative view of ceramics and their significance in public and domestic spheres. In this paper, I discuss the role of ceramics in ritual offerings and analyze them in tandem with the other forms and mediums they accompany. The contexts for these offerings differ from those of funerary ritual in which whole objects are placed with the dead. My analyses indicate that the end cycle of ceramics is diverse, that their substance is valued in whole and fragmentary form, and that their

spatial orientation is significant. I offer insight into how ceramics as substances interact and complement other materials in offerings and how this bears upon our interpretation of specific iconographies and design symbols and their respective meanings.

[19] *Chair*

Wernke, Steven (Vanderbilt University) and Julie Adams (Vanderbilt University)

[235] *Views From Above: Using UAVs and Mobile GIS to Map a Colonial Settlement in Highland Peru*

A wide range of medium-scale archaeological phenomena—from large settlements to agricultural and infrastructural systems—are traditionally mapped either schematically or via time- and labor-intensive high resolution methods. Aircraft-mounted LiDAR provides fast, high resolution mapping capabilities, but is out of the budgetary reach of many projects. This poster presents results from initial test flights, imagery capture, three dimensional photogrammetric mapping, and mobile GIS-based attribute registry of architecture at a large, complex colonial planned settlement (Mawchu Llacta de Tuti) in highland colonial Peru. First, the operating parameters of the Aurora Flight Sciences packable, fixed-wing SKATE Unmanned Aerial Vehicle (UAV) system employed in this high altitude setting (4100 m) are presented, as well as the imagery capture and photogrammetric processing workflows. Second, the poster provides an overview of the tablet-based mobile GIS system used to digitize a site plan (based on the imagery from the UAV) and register 64 architectural attributes from each structure. The results from initial testing suggest that in the near future, inexpensive and packable UAV- and mobile GIS-based systems will significantly enhance and expedite high resolution data registry of archaeological sites and landscape features.

Wernke, Steven [235] see Norman, Scotti

Wescott, Konnie (Argonne National Laboratory) and Stephen Fosberg (Bureau of Land Management)

[91] *Mitigation Planning for Addressing Unavoidable Impacts of Solar Energy Development: A Shift from Project Scale to Regional Scale*

The U.S. Department of the Interior, Bureau of Land Management (BLM), and the U.S. Department of Energy (DOE) recently released the Final Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States (Solar PEIS). The Solar PEIS addresses the environmental impacts of establishing a solar energy program that encourages concentrated development in BLM-administered Solar Energy Zones (SEZs). The Solar PEIS also provides a series of programmatic-level design features to mitigate (through avoidance and minimization) as many potential impacts as possible. The BLM is now embarking on a mitigation pilot to address the mitigation of specific unavoidable impacts that are possible within the SEZs. Cultural and tribal issues are among those impacts that may be unavoidable. The BLM is working with a variety of stakeholders, including affected tribes; federal, state, and local agencies; and the public to determine how best to mitigate these impacts. A regional approach is proposed. With the pilot for a regional mitigation plan for the Dry Lake SEZ in Nevada and the Solar Programmatic Agreement, the BLM is striving to facilitate consultation for handling mitigation issues as efficiently as possible. This work is supported by the BLM under interagency agreement, through DOE contract DEAC02-06CH11357.

[91] *Chair*

Wesler, Kit [284] see Roe, Lori

Wesson, Cameron [6] see Lobiondo, Matthew

Wesson, Cameron (Lehigh University)

[100] *Searching High and Low: Finding Poverty in the Past*

As a discipline, archaeology generally has been silent concerning the presence of poverty in the past. Is our collective silence simply tacit recognition that poverty is a difficult concept to define and identify using archaeological data, or might it reveal a great deal more about contemporary archaeological practice and the manner in which knowledge is produced within our discipline? This paper examines the potential for archaeologists interested in various forms of social inequality to operationalize poverty as a means of understanding human social interaction. Drawing upon archaeological data from Southeastern North America, I suggest that archaeological research directed at poverty—in all its various material manifestations—holds the potential to radically alter our understanding of social, economic, and political inequalities and open a vast undiscovered intellectual terrain upon which to examine the past.

[100] *Chair*

West, Catherine (University of Maine) and Fred Andrus (University of Alabama)

[172] *High-Resolution Sampling of Saxidomus gigantea in the Kodiak Archipelago*

Using a combination of sclerochronology and oxygen isotope analysis, this paper presents the preliminary results of a paleoenvironmental study using archaeological *Saxidomus gigantea* shells from Kodiak, Alaska. While shell carbonate can provide data to reconstruct marine temperatures and productivity, we hypothesize that the oxygen record presented here is driven by seasonal freshwater runoff. Detailed, chronological sampling provides a bi-weekly record that can be examined through time to look for changes in prehistoric climate and environmental conditions.

West, Eric [274] see Rolett, Barry

Westby, Kira [182] see Bathurst, Rhonda

Wester Davis, Sharon (University of North Florida)

[43] *House Societies in the Post-Chaco Era: The Use of Mortuary Practices to Define Space*

The fall of Chaco in the late 11th to early 12th century caused burials practices at Chacoan outliers to change, sometimes dramatically. At the Aztec Ruins, for example, the locations for Chacoan period burials were nearly as likely to be inside a structure as outside. Post-Chaco, these burials were almost all located within a structure. I examine how burials found at the Chacoan Great House sites such as Salmon Ruin, Aztec Ruins, and Pueblo Bonito may have changed the meaning of space for its residents. Did space use alter after the inclusion of a burial? Did domestic rooms become ritual spaces? How did burials alter continued domestic space? I also look for evidence that the internment of ancestors, or a continued veneration of the previously interred, created a deeper connection to rooms, room blocks, or even whole sites.

Weston, Darlene, Roberto Valcárcel Rojas (Departamento Centro-Oriental de Arqueología, CISAT), Menno Hoogland (Faculty of Archaeology, Leiden University, The Net) and Corinne Hofman (Faculty of Archaeology, Leiden University, The Net)

[254] *Communities in Contact: Health and Paleodemography at El Chorro de Maíta, Cuba*

Cuba was among the first areas in the New World where contact occurred between indigenous Amerindian populations and

Europeans. As the cemetery of El Chorro de Maíta encompasses indigenous use of the site through the pre-Columbian and post-contact period, it affords an opportunity to examine the influence of European contact on the health and paleodemography of the Amerindian population. Analysis of the 133 individuals at the site has revealed a population almost free of skeletal pathology, apart from a few cases of joint degeneration and minor trauma. The high proportion of young adult and child burials, coupled with a low number of mature adult burials is highly suggestive of a catastrophic mortality profile. The mortality profile and the relative paucity of pathological skeletal lesions suggests that acute infectious disease may have been an etiological factor in the construction of the site's demography, as it is frequently believed that pre-Columbian Amerindian communities lacked immunity to the diseases brought to the New World by the first Europeans. The dynamic nature of Amerindian and European interactions can also be seen via analysis of the site's variable mortuary practices, emphasizing the importance of combining osteological, taphonomic, and artifactual data when analyzing cemetery sites.

Westwood, Lisa (ECORP Consulting, Inc.)

[13] *World Heritage List Designations of Early Space Exploration Heritage Sites*

In 1972, near the apex of the Apollo era, the General Conference of the United Nations Educational, Scientific, and Cultural Organization (UNESCO) adopted the World Heritage Convention in a pioneering effort to protect universally important monuments, buildings, archaeological sites, and natural and cultural landscapes from being depleted. At that time and within that context, cultural heritage was defined by its location relative to then-current political boundaries on Earth. We now can broaden that view to encompass many other historic properties on Earth, on the Moon, and beyond. In applying a cultural landscape approach to early space exploration heritage, is it possible to designate a World Heritage List district of sites and properties that spans not only multiple countries, but planetary bodies as well?

[13] *Chair*

Weyrich, Laura (University of Adelaide), Christina Alder (University of Sydney), Keith Dobney (University of Aberdeen), Alan Walker (The Wellcome Trust Sanger Institute) and Alan Cooper (University of Adelaide)

[217] *Ancient Dental Calculus Reveals Shifts in the Human Oral Microbiome Corresponding with Neolithic Farming and the Industrial Revolution*

Links between the human microbiome and health have become increasingly apparent, although we still know little about how these bacterial communities were shaped over time. Morphological signs of oral disease indicate that the adoption of Neolithic farming (~10,000 yBP) and the introduction of industrially processed carbohydrates (~1,800 AD) had a major impact on the oral microbiome. Here, bacterial DNA from ancient dental calculus, or calcified dental plaque, was sequenced from early Neolithic (~5,500 BC) to Medieval (~1,550 AD) Europeans and modern humans to identify changes in the human oral microbiome over time. Although oral bacterial composition remained surprisingly constant between Neolithic and Medieval times, several carogenic bacterial species associated with periodontal disease were identified in Neolithic and Medieval Europeans, consistent with evidence of increased periodontal disease during the transition to farming. In contrast, oral microbiota from modern Europeans were significantly less diverse and dominated by carogenic bacteria, indicating a significant shift in the oral microbe during the Industrial Revolution. These data suggest that shifts in diet and farming may have molded the oral microbiome and contributed to modern chronic oral disease. Dental calculus provides a unique opportunity to reconstruct the evolutionary history of the human oral microbiome and bacterial pathogenicity.

Whalen, Verity [138] see Kellner, Corina

Whalen, Verity (Purdue University)

[214] *What Came before Wari: Late Nasca Interregional Interaction and Community Politics*

The late Early Intermediate Period (ca. AD 550-750) on the south coast of Peru marked a key historical moment. The indigenous Nasca society had undergone a period of sociopolitical change, exacerbated by prolonged drought, which culminated in the colonization of the region by the Wari empire. Here we present new data from Cocahuicho, a settlement in the Tierras Blancas Valley, which illuminate the historical context of this important instance of colonialism. At 10 hectares, Cocahuicho was the major Tierras Blancas settlement during the late Early Intermediate Period and is located less than 2km from Pataraya, the Wari way station that was established in Tierras Blancas during the subsequent Middle Horizon. Excavations and architectural analysis of domestic spaces were undertaken at the site to investigate the nature of Late Nasca society, which is still largely unstudied, and to historically situate the Wari colonial encounter in Nasca. Cocahuicho provides a local perspective on a time of rapid social change during which increasingly cosmopolitan actors challenged traditions and intentionally or not, set the stage for Wari colonialism.

[214] *Chair*

Wheeler, Sandra (University of Central Florida), Toshia Dupras (University of Central Florida) and Lana Williams (University of Central Florida)

[74] *The Largest Percent: Bioarchaeological Analysis of Children and Childhood from the Kellis 2 Cemetery, Dakhleh Oasis, Egypt*

Infancy and childhood have long been recognized as critical periods of increased physiological stress, morbidity, and mortality, and have therefore been the focus of much discourse in bioarchaeological investigations. In archaeological populations where child mortality is high, children often represent the largest percentage of recovered physical remains. However, textual and indirect archaeological evidence of childhood from the Romano-Christian period (c. 100-360 AD) has been used as the primary method in reconstructing lives, experiences, and deaths of children. Mortuary context and excellent preservation within Kellis 2 cemetery provide the rare opportunity to examine childhood from conception to adulthood. At present, 765 individuals have been recovered, 490 of which are juveniles. Results indicate that children of Kellis experienced variable birthing practices, specific and nonspecific stressors, violence and trauma, and that even the very youngest (e.g., 16 gestational weeks) and those with congenital conditions (e.g., anencephaly, osteogenesis imperfecta), were buried in the same context. This paper emphasizes the necessity of addressing issues of children's lives and mortality directly through analyses of physical remains. In addition, melding multiple lines of evidence including mortuary treatment, diet, growth and development, and health and disease, are vital to understanding textual aspects of childhood experiences in antiquity.

Wheeler, Sandra [219] see Williams, Lana

Wheeler, Ryan (Robert S. Peabody Museum of Archaeology)

[259] *Thinking about Animals in Ancient Florida*

Archaeologists and anthropologists have long recognized that humans have a complex relationship with animals that is intertwined with, and goes beyond, a need for food and raw materials. Exploring these relationships is important to deepening our understanding of American Indian cultures and orienting questions about decision making and thought in the past. This is certainly true in ancient Florida, where animals and animal parts are depicted in many media, interred (sometimes with humans), and crafted into objects that may reflect social, political, or religious symbolism. Two case studies—the panther in ancient

Florida and animal interments at the Miami Circle site—are used to explore themes of shamanism, sacrifice, rank, kinship, and food. In most cases these traditional categories are unsatisfying in understanding the more complex metaphysical dynamic between animals and humans and the resulting material remains.

[259] *Chair*

Whistler, Emily (California State University, Los Angeles)

[35] *The Middle Holocene Presence of Short-Tailed Albatross (*Phoebastria albatrus*) and Northern Fulmar (*Fulmarus glacialis*) on San Nicolas Island, CA*

Short-tailed albatross and northern fulmar have been recorded in several middle Holocene sites on the Channel Islands, including Eel Point (CA-SCLI-43), Little Harbor (CA-SCAI-17) and Thousand Springs (CA-SNI-11). The northern fulmar is an occasional visitor to the Channel Islands during its wintering months, although short-tailed albatross is rarely encountered. A recent discovery of an intact bird processing feature on San Nicolas Island (SNI) yielded the highest number of skeletal elements of short-tailed albatross (n=322) and northern fulmar (n=405) from any single component on the Channel Islands. In this paper, we present detailed information on this feature, compare it to other sites on the island, and discuss the potential ecological and environmental factors contributing to the presence of these relatively uncommon birds on SNI. Ethnographic accounts suggest that Aleutic peoples hunted albatrosses and fulmars using watercraft, clubs, bolas, and nets, all of which were used regularly on the Channel Islands. Birds, often understudied in archaeology, provided food, raw materials, and spiritual enrichment to peoples across the globe. The species we present on here are just two examples of the complex relationships that have developed between humans and birds on the Channel Islands.

[35] *Chair*

Whitaker, Adrian (Far Western Anthropological Research Group, Inc.)

[2] *Using Theories of Plant Food Intensification to Explain Shifts Toward an Emphasis on Small Shellfish Taxa*

Shellfish as a resource offer a perfect mix between the best attributes of both plant and animal resources. Like vertebrates, shellfish are high in protein and fat. Like plants, they are generally found in a known and fixed location, can be gathered by all members of a group including children and the elderly, and are relatively free from the propensity to over-exploitation seen with larger mammals and birds. As such, we argue that economic theories of intensification derived for plant foods may offer more appropriate models for explaining widespread evidence for an economic emphasis on small-sized shellfish taxa, which provide individually low returns on foraging. We draw on the record from California to explore the utility of such a research orientation. Examples of mass harvesting we present include bean clams (*Donax gouldii*) and black turban snails (*Tegula funebralis*) in southern California, California hornsnail (*Cerithidea californica*) in the southern San Francisco Bay, and barnacles (*Balanus spp.*) and chiton (*Cryptochiton stelleri*) in northern California. Finally, we examine how our findings might be applied to similar phenomenon elsewhere in the world.

[2] *Chair*

Whitaker, Adie [12] see Andolina, Darren

White, Carolyn

[73] *The Paniolo Project in the Context of Cultural Heritage in Hawaii*

The cultural heritage of the Hawaiian Islands is rich and diverse. Historical archaeology plays an important role in preserving and

exposing that cultural heritage, though it is sometimes overshadowed by scholarly work of earlier periods. This paper explores recent work on 19th century ranching in Hawaii in the context of cultural heritage. How does current work on 19th century ranching sites on Hawaii's Big Island intersect with the discourse of cultural heritage as constructed on a wide and global scale? Multiple sites on the slopes of Mauna Kea have been the subject of fieldwork undertaken by the University of Nevada, Reno and University of Hawaii Hilo and are used to explore the relationship between historical archaeology and cultural heritage in Hawaii.

[73] *Chair*

White, Christine [79] see Olsen, Karyn

White, Cheryl (Consultant in Anthropology /Archaeology)

[115] *Paths, Places, and Names: Ethno-archaeology and Maroons in Suriname, SA*

Throughout the New World gran maroonage has been a defining characteristic of seventeenth and eighteenth century Maroon culture. And during this formative period these bands of runaway slaves relied on African traditions of place naming to determine strategic routes, to what is today considered ancestral Maroon settlements. In the tropical rainforest of Suriname, South America Maroons utilized the intricate riverine system to traverse this small pocket of Amazonia. The following discussion will evaluate the African tradition of place naming, as an identifier of strategic Maroon settlements and attachment to land in Suriname's rainforest interior. In addition, ethnographic data of oral accounts and ethno-archaeology may help determine the role of place naming, associated ritual activity and patterns of settlement to the Amazonian landscape. Moreover, as with traditional historical archaeology the creolization paradigm acts as a pivot point for Africa-centered themes of: African ideology, place names, social constructs, perceptions of blackness, and the expression of kinship in relation to spatial patterns. These combined methodological efforts may lead to a better understanding of why and where Maroons chose a settlement as they made their way to freedom.

White, Paul (University of Alaska Anchorage), Patrick Martin (Michigan Technological University) and William Hedman (Bureau of Land Management)

[184] *Hazardous Heritage: Assessing the Legacy of Abandoned Mines in Alaska's Fairbanks District.*

In recent decades, federal and state agencies in the United States have increasingly targeted historic mines for assessments of safety hazards and environmental contamination. Although remediation can occur during this process, archaeologists are seldom involved in early stages of site inventories and in some cases are ignored altogether. In 2010, the Bureau of Land Management entered into a cooperative agreement with archaeology programs at two universities to inventory abandoned mines in the Fairbanks District, central Alaska. Gold was discovered near Fairbanks in the early 1900s, and the region subsequently witnessed decades of intensive exploration, with miners leaving dredge tailings, waste rock piles, and numerous pits and shafts in their wake. Field seasons in 2011 and 2012 surveyed approximately 4,000 acres of federal lode and placer claims and documented in excess of 1,000 mining-related features. This poster presents the archaeological findings, highlighting the district's heritage value as well as leading safety hazards. Noted here are also the qualitative and quantitative differences between safety hazard inventories generated by archaeologists and by environmental scientists.

White, Joyce (Univ of Pennsylvania Museum)

[216] *Where Did the Early Bronze Technology in Thailand Come from?*

The methodology by which archaeometallurgists address the topic of the spread of metallurgy is undergoing a paradigm shift. Close attention must be paid to tracing not just paths by which an alloy or a metal object type spread, but rather paths by which a technological system spread. This system is revealed in manufacturing chaînes opératoires. Considerable progress has been made in delineating variant chaînes opératoires for producing bronze artifacts in prehistoric Thailand. This paper specifies the evidence needed from neighboring areas, particularly in south and southwest China, in order to go forward in the investigation of the origins of bronze technology for Southeast Asia.

Whitehead, William (Ripon College)

[132] *Paleoethnobotany in the Middle Horizon: A Review and Look Forward*

Paleoethnobotany (PEB) is a vital part of understanding the economy, diet, and interaction between ancient cultures. The state of knowledge in PEB for the Middle Horizon will be reviewed, and the implications for understanding the human modified landscape and economy will be summarized. Middle Horizon cultures such as the Hauri and Tiwanaku will be discussed and how PEB as allowed us to understand these nascent empires in a wider and more complete context. New research on domesticated plants such as maize, quinoa, and potato will be presented, and how this research has changed the way we think about domestication in the Middle Horizon. The future of research for the Middle horizon will also be explored with areas of research needed highlighted.

[232] *Discussant*

Whitehead, William [183] see Twaroski, Rebecca

Whiteley, Peter

[67] *The Native Shaping of Anthropological Inquiry*

How anthropological questions are devised and evolve has often been seen in a vacuum. In keeping with the scientific project, archaeologists and anthropologists frame their questions in a fashion that appears conceptually autonomous, driven only by a self-generating logic. How does a social formation change? What are the structural consequences of prescriptive cross-cousin marriage? And so on. Yet more often than not, ever since L.H. Morgan and Ely Parker, anthropology's most important insights have grown directly out of indigenous interests and perspectives, through which Native analytical thought has shaped disciplinary inquiry itself. This paper addresses some contributions of Leigh Kuwanwisiwma to that dialectic.

Whitley, David (ASM Affiliates, Inc.)

[18] *Hawaiian Cupules and Numic Vulva-Forms: Aspects of Gender and Rock Art*

Cupules and vulva-forms are two of the stylistically simplest, yet most common, rock art motifs. Vulva-forms are widely assumed feminine-gendered and linked generically to "fertility," implying that procreation is the only feminine symbolic possibility. Nineteenth century Hawaiian ethnography links Poho (cupules) to mothers and their ritual disposal of their child's umbilicus. Detailed attention to ethnography and culture-specific symbolism suggests more nuanced meanings: the Numic vulva-form as representative of the inherently dangerous nature of female sexuality, and the Poho was symbolic of the Piko (naval), the Hawaiian's center of being.

Whitley, Catrina [276] see Skinner, Alan

Whitley, Catrina (Office of Archaeological Studies, Museum of NM)

[286] *Female Kiva Societies in the Taos Valley: Mortuary and Bioarchaeological Evidence*

The incorporation of a wider range of bioarchaeological data with mortuary practices can provide a clearer method for archaeologists to perceive social structure. In isolation, each can provide an interpretation of an individual's position within their community, but results from each study may be contradictory. For example, evidence of egalitarianism in mortuary ritual may not be a complete reflection of the complexity inherent within a group. Likewise, poor health may not always indicate lower social position or lack of prestige. Only by merging the two lines of evidence can a more complete understanding of social structure and how an individual's social position can affect their health and life expectancy be revealed. This paper presents a concrete example of the need to combine mortuary and bioarchaeological data to garner a more complete interpretation of health, risk, and social structure by using data from Pot Creek Pueblo (AD 1260-1320) in the Taos Valley. Inclusion of osteological datasets, beyond simple sex and age divisions, with the mortuary datasets and architecture revealed a structured division of labor among the females, resulting in one labor group potentially having ritual prestige. However, the prestige and status of these females did not buffer them from poorer health.

Whitmore, Alissa (University of Iowa)

[96] *Sewing in the Baths? Archaeological Evidence for Cloth-Working in Roman Public Baths*

While ancient texts provide information on Roman bathing practices, as well as some non-bathing activities which took place in the baths, these sources are often silent on activities and social groups deemed too "common" to merit discussion. My research examines artifact assemblages found in Roman public baths and their drainage systems, and these lost or discarded possessions of bathers can shed significant light on everyday activities in the baths. Cloth-working utensils, including needles, awls, spindle whorls, loom weights, and weaving plates, have been found among artifact assemblages from nearly a dozen Roman public and military baths in Italy, Portugal, and the United Kingdom. While some of these objects come from unstratified or possibly intrusive contexts, other artifacts are from proveniences that can be securely dated to the bath's period of use, suggesting that cloth-working was among the typical activities which took place in some public baths. The presence of these objects not only illustrates an activity which ancient texts ignore, but also has implications for our understanding of the social groups, predominately women and the lower classes, that performed this work in the baths.

Whitridge, Peter (Memorial University of Newfoundland)

[136] *Animals and the Sensory Envelope of Inuit Lives*

The absolute centrality of animals to Inuit foodways is well-attested zooarchaeologically, but it is also clear that animals represented much more than a source of nourishment. In the botanically impoverished Arctic, shelter, clothing, boats, tools and fuel were often largely assembled from animal products, and domestic dogs were important hunting and travel aides. As the core economic activity, hunting organized social relations within families and communities, and Eastern Arctic belief-systems centered around a chimerical deity who was once married to a dog or a raven and controlled the availability of game. And at the level of daily practice, animals thoroughly infiltrated the Inuit sensorium: the feel of hide, feathers and sinew, the sound of dogs barking and a seal exhaling in its breathing hole, the smell of fur clothing and meat cooking, the taste of seal broth and dried caribou, and the sight of all these things. Attending to the sensory entailments of human-animal relations forces archaeologists to imagine the phenomenological complexity of the Inuit lifeworld and the primacy of non-human animals within it, and draws out webs of unanticipated associations between people, animals, things, activities and representations.

Whittaker, John (Grinnell College), Kathryn Kamp (Grinnell College) and Byl Bryce (Southwest Archaeology Research Alliance)

[39] *Projectile Points from the "Magician" Burial*

Projectile points are a rare but recurring feature of important burials in the Southwest. The so-called "Magician" of Ridge Ruin, an adult male with numerous unusual grave goods, has affected our ideas about prehistoric society throughout the region. One unique aspect of the burial, an assemblage of over 400 projectile points, has received little attention. These points are both consistent with, and different from, contemporary point assemblages from sites in the region, and offer another body of evidence to interpret the burial in light of current understandings.

Whittaker, Joss (University of Washington)

[84] *Trade Frontiers in the Aru Islands, Indonesia*

The Aru Islands, lying in eastern Indonesia on the boundary between island Southeast Asia and Oceania, show evidence for remarkably vigorous trade given their remoteness from larger regional trading centers. This trade began at least in the late fifteenth century, before European contact, and continued afterward, as a profusion of Chinese and European ceramics and glass attests. Using surface finds in two Aru villages (Ujir and Kota Lama Wokam), combined with information from ethnographic and historical documents, this paper examines Aru's significance as a distant outpost of at least four extensive trading networks: Chinese, Islamic, Portuguese, and Dutch. In addition, this paper explores the significance of Aru's position astride two broadly recognized archaeological and ethnological regions. The mixture of Southeast Asian and Oceanian cultures evident in Aru raises questions about the sharpness of distinction between these two regions on their supposed shared boundary.

Whittlesey, Stephanie (Harris Environmental Group)

[64] *The Legacy of Behavioral Archaeology at Grasshopper*

Behavioral Archaeology emerged at the UA Field School at Grasshopper under the influences of Jefferson Reid and Michael Schiffer. Behavioral Archaeology, especially as it was practiced at Grasshopper, affected the professional research of an entire generation of archaeologists. In this paper, I discuss its influences on my own research at Grasshopper and beyond, the important melding of academic and cultural resource management research under Behavioral Archaeology's umbrella, and the significant principles that behavioral archaeologists developed or expanded in the post-Grasshopper years. Some of these include the cultural landscape approach, the archaeology of ritual and ideology, migration theory, ethnic identity, and ethnic coresidence.

Whittlesey, Stephanie [175] see Reid, Jefferson

Wiber, Melanie [24] see Blair, Susan

Wieland, Lynn-Marie

[217] *Fishing Tools at Richardson Park*

Richardson Park is located on a ridge above Lake Mamanasco in Ridgefield, Connecticut. Lake Mamanasco is a kettle pond whose shore was home to Native Americans for 10,500 years. The period of heaviest occupation was during the Late Archaic. The hearths, dwellings, and storage pits are from this period. Work areas for tool making, working hides, cooking, and working wood tools date from the Middle Archaic. There are diagnostic tools from the Late Paleo to Late Woodland. Expedient tool industries are represented by flake cores, bipolar cores, blade cores, and utilized expedient flakes. Among these formal and informal tools are small points, thumbnail scrapers, and tiny semi-lunar knives. They were

found clustered along the lakeside in association with charcoal, and small post molds. Small semi-lunar knives were found paired with thumbnail scrapers, and occasionally tiny points, in food preparation areas, and hearths. They were used from the Late Archaic to the Late Woodland. Semi-lunar knives and thumbnail scrapers have been associated with fishing from the Middle Archaic, and probably earlier. This collection of small points, tiny semi-lunar knives, and thumbnail scrapers were part of the fishing industry at Richardson Park.

Wiersema, Juliet (University of Texas, San Antonio)

[19] *Moche Architectural Vessels as Diagrams of Sacred Space*

Of the hundreds of thousands of surviving Moche sculpted and painted ceramic vessels, some of the most compelling depict miniature representations of architecture. These objects (known as architectural vessels) are significant to our understanding of this culture because they preserve information about Moche ritual structures which has been irreparably compromised by centuries of treasure hunting, erosion, and cataclysmic events. My research has revealed that Moche architectural vessels not only document otherwise lost aspects of Moche monumental architecture but also present us with schematic diagrams of specific and identifiable structures, directing us to the precise location of shrines or oracles in full-scale Moche architecture. Through the careful selection and inclusion of sculpted and painted details, Moche potters developed a visual language that allowed them to transform an earthenware container into a specific and identifiable architectural space.

Wiessner, Polly [248] see Slater, Philip

Wiggins, Kristina [150] see Andrefsky, William

Wigley, Sarah [78] see Levi, Laura

Wilcox, Michael (Stanford University)

[169] *Origins, Influences and the Future: Indigenous Archaeology and the Narratives of History*

Indigenous Archaeology can be broadly defined as an emergent set of practices that consciously attempt to connect (or reconnect) indigenous peoples with landscape, material culture, ancestors and narratives of the past- with the understanding that these links are vital to the health of Indigenous peoples. Indigenous Archaeology has been both celebrated as the future of the discipline and criticized as exclusive, anti-scientific or "intellectually unviable". What factors have led to the development of this approach? How might the involvement of Indigenous Peoples transform the discipline?

Wilcox, Timothy (Stanford University)

[169] *Challenging Imposed Boundaries: A Decolonization of Dine' History*

A multitude of boundaries exist on the land, bodies, and histories of Native Americans. These boundaries are manifested in colonial definitions of what it is to be Native American: reservations, blood quantum, federal recognition, and the construction of archaeological cultures and typologies. No tribal nation is immune to these impositions and the knowledge produced by archaeologists has affected the ways Indigenous populations are perceived. These perceptions have real consequences. In the case of the Navajo Nation or Dine', established site, pottery and lithic typologies need to be reevaluated so that these boundaries can be reassessed or dissolved. Recent scholarship, by Southwestern and Navajo Archaeologists, has initiated this

process by examining topics ranging from the creation of a culturally sensitive Navajo archaeology to a closer examination of the archaeological record using contemporary theoretical foundations and scientific instrumental analysis. This paper will highlight these discussions and my own work which will take a comprehensive look at Navajo pottery production through technological style and communities of practice frameworks. In addition, I will incorporate new ethnographic data and my own experience as a traditional potter to show that these boundaries are amorphous and dynamic.

Wildt, Jennifer (Boston University)

[21] *Peopling the Plazas at Xultun, Guatemala*
Plazas play a significant role in society by bringing together members of a community to renew their group identity and accumulate shared experiences. In ancient Maya cities, plazas were the centers of ritual, economy and social life, but studies tying them directly to the individuals who utilized them are lacking. To address this gap, this paper includes excavations of three distinct plazas and an adjacent residential area at the Classic period site of Xultun, Guatemala. This study of plaza architecture will focus on understanding meaning in built environments and the role of performance in ancient Maya society in order to determine the types of rituals and ceremonies that took place in each plaza. Connecting these individuals to particular types of rituals will allow me to draw conclusions about the roles that ritual played in their lives and ultimately address the functionality of plazas in Classic Maya society.

Wilkerson, Emily (Sunstone Archaeological Consulting) and Ania Baran (Katzie Development Corporation)

[266] *Challenging Past Assumptions Regarding Beads in the Salish Sea: Preliminary Bead Assemblage Analyses at DhRp-52*
Salvage excavations at archaeological site DhRp-52 (Southwestern British Columbia) recovered over 100,000 stone disc beads from site deposits in 2006 and 2007. DhRp-52 is a unique multi component pre-contact village site situated in Katzie Traditional Territory. While not unique to DhRp-52, similar types of beads have been found at other sites within the Gulf of Georgia region. When found, past assumptions and hypotheses suggested these types of beads to be labour intensive; to occur more often in later Marpole deposits; to most commonly occur in mortuary contexts; to all be made from slate; and to indicate the presence of status at a site. The quantity, variety, and distribution of beads at DhRp-52 challenges these past assumptions and may provide new insights concerning the role stone disc beads may have played for Charles Culture populations. This research builds upon previously developed bead analysis techniques by supplementing them with a combination of morphometric analysis and GIS distribution analysis to better understand how the bead assemblage is associated with site structure and to reflect upon how the site, and its bead assemblage, fits within regional chronology.

Wilkins, Jayne [76] see Schoville, Benjamin

Wilkins, Jayne (University of Toronto)

[76] *The Early MSA 500 ka: Evidence from Kathu Pan 1, South Africa in the Context of the African Archaeological Record*
The stratum 4a Fauresmith-designated assemblage at Kathu Pan 1 (KP1) in the Northern Cape of South Africa provides early evidence for many Middle Stone Age (MSA) innovations, including systematic blade production, Levallois core reduction, and lithic-tipped spears. The stratum 4a assemblage has been chronometrically dated by OSL to 464±47 ka and combined U-series/ESR to 542 +140/-107 ka. While surprising, these data are not contradictory with the African archaeological record. Other archaeological occurrences dated to between ~500 and 300 ka

also contain MSA elements. Handaxes persist for a long time in Africa, until ~130 ka, but after ~500 ka, they occur in association with MSA technologies. At KP1, the stratum 4a Fauresmith handaxes are more weathered and patinated than the rest of the 4a assemblage, suggesting the possibility the handaxe component is intrusive. The relatively recent advances in chronometric dating together with weak archaeological visibility during the early Middle Pleistocene could explain why the MSA has not been previously reported from contexts >300 ka. The rough temporal correlation of the appearance of MSA and hafted spear technologies with the divergence of the Neanderthal and human lineages ~800-400 ka gives a parsimonious explanation for technological similarities between MSA and Middle Paleolithic assemblages.

Wilkinson, Darryl (Columbia University)

[134] *The Estate Archipelago of Tawantinsuyu*

One of the core institutions of the Inka polity was the system of royal estates of the imperial heartland around Cuzco. This paper considers the appropriateness of the metaphorical conceptualization of these installations as an archipelago - that is, as a subset of bounded sites and parcels of land that were distinct with respect to other kinds of state installations or settlements in adjacent zones. In addition, John Murra's use of the terms 'verticality' and 'vertical archipelagos' to describe Andean communities will be assessed in terms of their implications regarding the royal estate phenomenon. Finally, island metaphors with respect to imperial polities will be considered more generally, asking: what are the unspoken, but often assumed connotations of such modes of description? Does invoking figurative islands always imply literal insularity and isolation? How might alternative terms such as 'network' or 'system' shift the implicit understandings that are conveyed?

[134] *Chair*

Willems, Willem (Faculty of Archaeology, Leiden University)

[257] *Learning by Doing. Dilemmas in Practice and Other Heritage Education Issues*

The paper will explore some of the ways in which in the Heritage Management programme at Leiden University works. Students do, of course, need a firm background in the varied issues that are relevant to heritage management around the world. But just as the study of the past needs fieldwork, the study of the role of the past in the present cannot be restricted to theory. The paper will examine student projects at Robben Island SA, and in Palestine.

[31] *Discussant*

Williams, Kevin [40] see Anselmi, Lisa

Williams, Sarah (Washington State University)

[50] *Palynological Investigations during the Colonial Reducciones at Magdalena de Cao Viejo, Peru*

A palynological analysis was conducted on thirty-five pollen samples from the Spanish colonial town of Magdalena de Cao Viejo at El Brujo Archaeological complex on the north coast of Peru. Samples were collected from a variety of contexts at this archaeological complex, including the colonial church and domestic compounds. This project focuses on the impact of the colonial reducciones, a period of colonial upheaval and forced migration during the 16th century. Forcing the natives into planned communities would have involved a shift in plant use for consumption and building purposes that would be reflected in the pollen record. Palynological analysis also provides insights into anthropogenic and natural changes in environmental conditions on the local and regional scale. There has been a dearth of palynological research during colonial times in this region. Therefore, this paper will provide informative data for the interpretation of the colonial reducciones.

Williams, Patrick (Chicago Field Museum) and Donna Nash (UNCG)
[61]

Ritual Practice and Wari State Expansion

The role of ritual and religion in the expansion of archaic states is often overlooked in favor of militaristic or economic explanations. We explore the role of ritual practice in the reproduction of social order at the Wari (600-1000 CE) colony in Moquegua, Peru. We focus on activities of ritual importance in three distinctive types of ceremonial architecture around Cerro Baúl: Wari D-shaped temples, Tiwanaku tripartite monuments, and huaca shrines. All take place contemporaneously on and around the Wari citadel situated on the 600 meter tall mesa on the southern Wari frontier. We argue that the diverse rites in these complexes promote the promulgation of distinct elite identities within the cosmopolitan sphere of what constituted Wari provincialism. However, it is the inclusiveness of ritual practice in the Wari centers that is most distinctive of Wari doctrine. It is through this incorporation of elite diversity in particular places on the landscape that Wari was able to weave together the foundations of the Andes' first empire.

Williams, Alexandra

[120] *Household Organization in the Fur Trade Era: Spatial and Socioeconomic Relationships of Housepit 54*

As a link between micro and macro social processes, households are fundamental units of society that yield powerful explanatory potential. Yet, few studies have approached household organization during the critical Colonial period within the Middle Fraser Canyon. The 2012 excavation of Bridge River's Housepit 54 offers rare opportunities to investigate such spatial arrangements and implied socioeconomic relationships. I will perform spatial analyses drawing on lithic, faunal, and feature data to determine whether the interior of Housepit 54 was organized by shared activity or individual family areas. This investigation will enhance our understanding of household archaeology during the Fur Trade Era.

Williams, Kimberly and Lesley Gregoricka (University of South Alabama)

[190] *Third Millennium B.C. Mortuary Practices of Northern Oman: Placement and Use of Space in Mortuary Monuments*

The Social, Spatial, and Bioarchaeological Histories of Ancient Oman research project examines the mortuary archaeology of a rural region in northern Oman, focusing on the Al Khubayb necropolis located along an ancient trade route rich in mortuary monuments spanning the third millennium BC. Excavation of undisturbed tombs in concert with geospatial modeling of the more than 300 tombs on the necropolis, radiocarbon dating, and examination of monument architecture have shed light on the creation and use of this mortuary landscape.

This paper presents evidence of the mortuary rituals at Al Khubayb and compares these data with what is known from better studied and documented sites often associated with contemporaneous large urban centers. Evidence about the use of variable mortuary architecture and mortuary rituals at this location contributes new information about the rural people who were integral to local trade and movement of goods to and from nearby ports. By extension, this informs our understanding of the interaction of these semi-nomadic people with larger agents of Mesopotamia and beyond.

Williams, Cheraki

[198] *Louisiana's Continuing Education in Online GIS*
 Louisiana SHPO strives to provide pertinent archaeological information to researchers through an online GIS. The Hurricane Katrina disaster solidified SHPO's need to develop the GIS and address access issues quickly. SHPO staff was provided minimal

training in GIS while an outside company created the shapes, database, and website. Since 2005, SHPO has identified several challenges that need to be addressed regarding digital data maintenance, data sharing, and the value of the website to researchers. With the initial online GIS nearing completion, SHPO has made changes and additions to the online data and is delving into data sharing issues. An improved version of the website will be launched in 2012.

It is apparent that continued education is necessary if Louisiana SHPO is going to provide effective, updated GIS tools. Louisiana SHPO is exploring web-based training options to help researchers get the most value from online data. While budget constraints hinder the opportunity for additional SHPO staff training, education is essential for both providing archaeological digital data and using it effectively. Continuing education is critical for both sides of the SHPO/researcher. Finding educational solutions for SHPO and researchers is a continuing challenge for Louisiana.

Williams, Lana (University of Central Florida), Sandra Wheeler (University of Central Florida) and Toshia Dupras (University of Central Florida)

[219] *Solar or Social? The Seasonal Birthing Cycle of Kellis 2 Cemetery, Dakhléh Oasis, Egypt*

Seasonality in birth and mortality is one of the most fundamental and enduring phases in life's rhythms, often embodying the interplay among physiology, environment and human decisions that give a population its particular shape. Latitude and solar cycles are recognized as being primarily responsible for seasonal amplitude in births, with comparable regions of the world displaying similar patterns. However, based on a few surviving census documents, it has been suggested that patterns of infant birth for Roman Egypt are seasonally reversed from other Mediterranean regions. Excellent preservation within Kellis 2 cemetery allowed for reconstruction of seasonal infant birth and mortality ($n = 124$) and mortality for birthing-age women ($n = 86$) during the Romano-Christian period (c. 100-360 AD), offering a unique opportunity to test this claim and shed light on local social and environmental interactions influencing seasonal birth amplitude. Results indicate that seasonal patterns of birth for Roman Egypt were most likely offset by social behavior related to perceptions of fertility and annual inundation of the Nile. This emphasizes the necessity of addressing issues of mortality and fertility directly through analyses of physical remains and that multiple lines of evidence are vital to understanding aspects of sexual and reproductive behavior.

Williamson, Ronald F. [65] see Birch, Jennifer

Williamson, Ronald (Archaeological Services Inc.) and Robert MacDonald (Archaeological Services Inc.)

[221] *Echos of the Iroquois Wars: Contested Heritage and Identity in the Ancestral Homeland of the Huron-Wendat*

The Wendat (Huron) and Haudenosaunee (Five Nations Iroquois) were two of the most powerful tribal confederacies initially encountered by Europeans during the seventeenth century in eastern North America. Traditional rivalries between these and neighboring Algonquian groups escalated as they were all drawn into a complex web of global geopolitics and economics locally fueled by competition for trade in beaver pelts. After the dispersal of the Wendat from southern Ontario in 1650, the Haudenosaunee briefly held the north shore of Lake Ontario, but by 1700 the region was held by Algonquians including Ojibwa and Mississauga nations who had come from northern Ontario. Power struggles amongst the First Nations and their European allies continued well into the eighteenth century, but these gradually abated and by the mid-nineteenth century, encroachment by European settlers had largely circumscribed First Nations communities. Nevertheless, old rivalries die hard, and today beaver pelts have been replaced by archaeological sites as contested commodities in the ongoing quest for land, rights, resources, and power. This paper explores

the role that archaeological heritage plays in the modern-day identity politics of Aboriginal people in southern Ontario.

Willian, Jay [51] see Hurst, Winston

Willis, Lauren (University of Oregon), Leslie Reeder-Myers (Southern Methodist University), Jon Erlandson (University of Oregon), Torben Rick (Smithsonian Institution, National Museum of Natura) and Jack Watts (University of Oregon)
[70] *Edible Native Plants on the Northern Channel Islands, California*

Traditionally, archaeologists have characterized California's Northern Channel Islands as relatively depauperate in terrestrial flora and fauna compared to mainland California. Archaeologists have used this characterization to support arguments for lower population densities on the islands, the emergence of elite control of island-mainland trade, and the marginality of the islands for resource availability and human settlement. This characterization can be traced as far back as the earliest Spanish accounts of the region, with the only accounts of Chumash terrestrial plant resource use recorded during the early 20th century. Our understanding of native island plant resources is hindered by biases in early Spanish accounts, and the fact that Chumash accounts of plant uses were recorded a century after the Island Chumash were forcefully relocated to the mainland and after overgrazing by introduced livestock during the 19th and 20th centuries. We compiled a comprehensive list of edible plants native to the Northern Channel Islands, including terrestrial and marine species. Combined with predictive models of prehistoric plant communities, our study challenges the supposed marginality of the Northern Channel Islands throughout the late Pleistocene and much of the Holocene.

Willis, Mark [125] see Brown, David

Willis, William (Radford University)

[148] *Geochemical Comparison of Lithic Assemblages from Different Geographic Localities in Virginia*

The geochemical sourcing of lithic materials allows for a greater understanding of the mobility of archaeological populations, their interaction with other groups, and the optimality of their resource acquisition strategies. While instrumental neutron activation analysis is often a preferred method for geochemically characterizing lithic materials, portable X-ray fluorescence devices may do an adequate job exploring these properties. This study utilizes a Niton XL3T600 series portable XRF unit to study the geochemical characteristics of lithic assemblages from sites in Virginia that are located along three different river systems. It is hypothesized that with this unit, geochemical groupings can be identified through the usage of multivariate statistical techniques. Geographic location and qualitative characteristics of the artifacts themselves are used as grouping variables and the reliability of these variables as predictors of geochemical composition is explored. It is also hypothesized that artifact assemblages from within each site will be made up of predominately geochemically similar artifacts which should be consistent with what is expected of an optimized resource acquisition strategy. The implications of the results, as well as the limitations with the methodology of this study are discussed and an extensive geochemical survey of local lithic resources is called for.

Willoughby, Pamela (University of Alberta)

[8] *The Stone Age Prehistory of Iringa, Tanzania*

Iringa is a Region (province or state) in the Southern Highlands of Tanzania. It is well known for the number of large rock outcrops, some of which contain caves or shelters. These contain an archaeological record extending from the early Middle Stone Age to historic and modern times. The members of the Iringa Region

Archaeological Project (IRAP) have excavated at two rockshelters, Magubike and Mlambasi, and have identified many more rockshelter and open air sites. Excavations at Magubike have shown that it was first occupied early in the Middle Stone Age, then more or less continuously afterwards. There are also signs that it was occupied during the late Pleistocene, when cold, dry conditions led to the reduction of human and animal populations in lowland regions of East Africa, especially in the Rift Valley. This population reduction is seen in the mitochondrial DNA sequences of living people, and may explain the lack of modern humans outside of Africa until around 50,000 years ago. This poster documents the archaeological sequence at Magubike and how it relates to the possibility that the Southern Highlands contained an Ice Age refugium for modern humans.

[8] *Chair*

Wills, Richard [251] see Pietruszka, Andrew

Wilson, Gregory [6] see Gracer, Allison

Wilson, Meredith (Stepwise Heritage and Tourism, Australia)

[163] *Markers of Mortality: Exploring Spatial Patterning in the Rock Art of Vanuatu*

Drawing on a large corpus of rock art sites from Vanuatu as well as comparative material from other areas in the Pacific, this paper explores the way in which rock art demarcates space both across the landscape and within sites. The rock art of Vanuatu is unusual in that it acts as a net for a range of elements and styles of rock art that appear historically or geographically discrete elsewhere in the region, providing a rich archive of the rules and conventions of place marking found throughout the western Pacific. Broad patterns can be discerned in the distribution of techniques and motifs, and their positioning, that allow us to propose social and cultural contexts for the production of rock art. In particular the paper emphasises an enduring relationship between western Pacific rock art and mortuary practice.

Wilson, Douglas (Portland State University/National Park Service)

[261] *The Fort and the Village: Landscape and Nationality in the Colonial Period of Fort Vancouver*

Fort Vancouver, located in southwestern Washington, was the headquarters and supply depot for the Hudson's Bay Company in the Pacific Northwest, essentially its colonial capital between 1825-1845. It continued as a subsidiary retail and trade outlet until 1860 and coexisted with the first U.S. Army fort in the region until the U.S. Army burnt or otherwise destroyed most of its structures. The documentary records for Fort Vancouver suggest a spatial segregation between the fort and the village along class lines which separated the elite managers of the company from its employees (engagés). The physical structure of the post reinforces this economic and ethnic hierarchy in a manner similar to other major fur trade posts of the period in Canada (e.g., Upper Fort Garry). Archaeological and ethnohistoric data, however, tend to blur these sharp lines as artifacts, pollen, and other data reveal a more complex colonial milieu tied to the unique multicultural nature of the settlement and ties to indigenous and other non-western communities. It is argued that the development of a unique Fort Vancouver community tied to British interests led to its demise during the period of American colonial settlement in the 1850s.

Wilson, Nathan (Arizona State University) and Xochitl Leon Estrada (Universidad Nacional Autonoma de Mexico)

[275] *Teotepec and the Tuxtla in the Formative Period*

The Sierra de los Tuxtlas region of southern Veracruz, Mexico, was characterized by substantial regional population increase during the Formative Period (1400 BC-AD 300) before Terminal

Formative Period volcanic activity induced significant regional population decline (and abandonment in some areas of the region). By the Late Formative Period, incipient political hierarchies had developed, headed by La Joya and Chuniapan de Abajo within the Catemaco River Valley. The site of Teotepec, located 5-6 kilometers east of the Catemaco River Valley, possesses evidence of substantial Formative Period occupation as well. Information from Teotepec can therefore provide a more comprehensive perspective of Formative Period occupation in the Tuxtla. Using data from the Proyecto Arqueológico Teotepec's (PAT) recent field work at the site, we will attempt to understand the sociocultural context of the site and elucidate its place within the political-economic landscape of the Formative Period Tuxtla.

Winburn, Amanda

[272] Social Class, Trauma, and Geographical Origin of Elite Individuals from Cancuén, Guatemala
This study examines 31 elite Maya individuals from the site of Cancuén (Petén, Guatemala), a Classic period lowland port city located on the interface between the highlands and lowlands, to evaluate frequencies and kinds of skeletal trauma and establish whether they were local or non-local. This skeletal sample is of particular interest because Cancuén was attacked and defeated in 799 AD, which directly preceded the "collapse" of the lowland Maya and marks this violent event as one with potential widespread implications. Skeletal trauma evidence suggests that many of the 31 elite individuals were violently killed (e.g. cranial blunt force trauma and rib fractures) and may represent a massacre. The bodies were deposited in a cistern. Strontium and oxygen stable isotope data is used to determine the geographic origin of the victims; are they "foreigners" from the highlands or are they local lowlanders? Sex-based patterns in those isotope ratios are used to document marriage and migration patterns. This research provides a systematic examination of the relationship between Maya elite social status, violence, and geographical origin, and it contributes to insights into the social implications of highland-lowland relationships in the Maya region.

Windes, Thomas [139] see Bellorado, Benjamin

Windy Boy, Alvin, Robert O'Boyle (University of Montana), Charles Bello (Environmental Planning / Historic Preservation Sec) and Duncan Standing Rock Sr. (Elder Chippewa Cree Cultural Resource Preservation)

[265] Tribal / Federal Partnership – Chippewa Cree Tribe and the Federal Emergency Management Agency (FEMA): Two Case Studies of Effective Hazard Mitigation and Cultural Resource Management on the Rocky Boy Reservation, Montana

The impact of natural disasters on cultural resources is well known in Western U.S. Indian Country. Tribal governments are often challenged in their ability to address such concerns. This poster addresses mitigation measures funded by FEMA through the Hazard Mitigation Grant Program in partnership with the Chippewa Cree Tribal Council and the Historic Preservation Office (THPO). Two projects are presented, both identified in the Tribe's Multi-Hazard Mitigation Plan.

The first repairs damage / stabilizes Crier's Rock, a traditional cultural property that is deteriorating. Geo-technical analysis and (green) engineering practices sympathetic to the importance of the site are employed, resulting from THPO input / conditions, guidance from elders, and cooperation from the BIA and Montana SHPO.

The second is an educational awareness project where funding mitigates against the loss of Chippewa Cree history and culture by training anyone who works on the Reservation. The project is overseen by THPO staff and combines a variety of innovative methods (weighted on traditional knowledge and Federal compliance). This project speaks directly to the Mission Statement

of the Tribe's Cultural Resource Preservation Dept. – "To maintain and inspire traditional values relating to the Ojibwa and Ne-hi-yah-w through established principles: Culture, History, Language and Life."

Windy Boy Sr., Alvin [265] see OBoyle, Robert

Windy Boy, Sr., Alvin J. [262] see Bello, Charles

Wingard, John, Margaret Purser (Sonoma State University), Katherine Dowdall (California Department of Transportation) and Otis Parrish (Kashia Band of Pomo Indians)

[111] Archaeologists, Localized Communities, and Emerging Models of Community Engagement

The concept of cultural resources has expanded over the last two decades beyond that of "archaeological sites" and "architectural features" to include places that are valued by localized cultural groups within a larger society. This increasingly puts heritage managers (including archaeologists) in positions of collaboration with small communities whose valued places are being disproportionately impacted. A body of literature is accumulating that describes projects that are taking an explicitly broad, collaborative approach to heritage management. We compare two examples, a diasporic community from Fiji and a traditional one from California, that represent an emerging type of heritage research that is both multi-disciplinary and community-based. Using community engagement models, the projects each developed mechanisms that maximize community participation including: 1) defining what elements of the local heritage count as important; 2) making decisions about how to best preserve, steward, or possibly revitalize those elements; and 3), developing concepts that are supportive of the community's relationship to their valued places. Of particular importance is the concept of cultural landscape which was used in each case to contextualize and define places valued by these communities, and to understand how the communities engage in active continuity with those places through time.

[111] Chair

Winslow, Deborah (National Science Foundation)

[133] "We Shape our Dwellings, and afterwards Our Dwellings Shape Us"

In 1994, Richard Blanton published Houses and Households. It is a typical Blanton tour de force. The scope is grand: peasant domestic life and the physical structures in which that life is conducted for 26 communities in six different areas of the world. As in his better known work on world and regional systems, Blanton salvages theories and methodologies from outside of anthropology, retrofits them to new uses, sees what wonders emerge, and then generously shares the possibilities with the rest of us.

Here I take advantage of that generosity to solve a puzzle from my own research in a community of potters in Sri Lanka. The potters prosper in part because they are surrounded by abundant high quality clay. Nonetheless, they rigorously limit access to the inferior clay of a clay commons. Why do they bother? When I used Blanton's graph theoretic methodology to analyze the new houses the potters' prosperity has allowed them to build, I found my answer. As Blanton observed, material objects both constrain the activities of those who access them and communicate to those who do not. Here, I present methods, data, and message, the latter surprisingly consistent from houses to commons.

Winter, Marcus [145] see Zapien Lopez, Victor

Winter, Marcus (Centro INAH Oaxaca), robert markens (unam mexico) and cira martínez-lópez (centro inah oaxaca)

[252] Late Postclassic Turquoise Mosaic Artifacts from Oaxaca

Artifacts with turquoise mosaics affixed to wooden backings have been found in several Late Postclassic archaeological sites in north-central Oaxaca, from the Valley of Oaxaca to the Sierra Mazateca. In addition to objects documented from Tomb 7 at Monte Albán and Tombs 1 and 3 at Zaachila, examples include masks from the Cueva de Ejutla (Mixteca region) and Cueva Cheve (Cuicatec), shields from Cueva Cheve and the Cueva de Tenango (Mazatec), an earspool and a spindle whorl from the Cueva de Ejutla and rectangular plaques from Cueva Cheve. Loose tesserae were found in the Cueva del Diablo near Mitla (Zapotec) and at Yucuita in the Nochixtlán Valley (Mixtec). We describe materials used in the mosaics, discuss artifact function and suggest possible exchange mechanisms through which the objects were procured

Wintz, Erik [186] see Rice, Omar

Wirth, Cynthia (Zemi Foundation) and Kelley Scudder-Temple (Zemi Foundation)

[91] Shipwrecks, Pirates, Governments, and Archaeologists: Is Collaboration the Key?

In the spring of 2012 the government of The Bahamas passed the Underwater Heritage Shipwreck Act. This legislation allows for a limited number of licensed excavations to be conducted by salvage companies under the supervision of appointed archaeologists and government officials. Due to the conflicting interests between salvage operations and the academic community few archaeologists have been willing to risk their academic credentials by working within the scope of these initiatives. This paper addresses the experiences of archaeologists who have attempted to develop a comprehensive research proposal that provides for collaborative efforts between salvors and archaeologists. Focusing on the question, 'Are commercially driven archaeological excavations comparable to terrestrial rescue archaeological initiatives or will this simply become another instance of destruction for profit?'

Wiseman, James. R. [288] see Burke Davies, Clare

Wismer-Lanoë, Meredith (University of Iowa), Brooke Arkush (Weber State University), Matthew Hill (University of Iowa), Emlyn Eastman (University of Iowa) and François Lanoë (University of Arizona)

[183] Exploring Late Prehistoric Subsistence Change at the West Fork Rock Creek Site (10Oa275), Idaho

Site 10Oa275 is located along the West Fork of Rock Creek within the Curlew National Grassland of Oneida County, Southeastern Idaho. Excavations conducted by Weber State University from 2009-2011 identified at least 11 living floors yielding various artifacts and a large faunal assemblage (NISP = 17,038). The site was occupied repeatedly as a short-term camp between A.D. 750 and 1800. Researchers from the University of Iowa and University of Arizona conducted a detailed analysis of the faunal remains, which range from large-game, such as bison and elk, to micro-mammals. This project explores shifts in the dietary contribution of the various game taxa at the site through time. Faunal analyses provide an important window into the dynamic subsistence practices of Native American foragers in the western Rocky Mountains prior to the Fur Trade Era.

Wisseman, Sarah, Thomas Emerson (University of Illinois at Urbana-Champaign), Randall Hughes (Illinois State Geological Survey) and Kenneth Farnsworth (University of Illinois at Urbana-Champaign)

[124] Pipestone Utilization in the Midcontinent

A team of archaeologists and geologists at the University of Illinois has spent over fifteen years analyzing quarry samples and artifacts from the Midcontinent. Using PIMA spectroscopy, X-ray diffraction and selected chemical techniques, we have identified previously unknown sources of pipestone in northern Illinois and Missouri and characterized sources in Wisconsin (Barron and Baraboo counties), Ohio (Feurt Hill and Portsmouth), Minnesota, and Kansas.

Our major findings are that prehistoric peoples sometimes chose their raw material for reasons other than proximity to a source of carvable pipestone, and that the Ohio sites of Tremper Mound and Mound City have completely different patterns of pipestone use despite their proximity to each other. Work continues to better understand the range of variation within individual sources and changes in pipestone use over time.

Witt, Thomas (SWCA) and Kathleen Corbett (SWCA)

[152] That Old Gold Mine Is Sitting on a Gold Mine: Preserving History in the Face of Active Industry

The machines, methods, and technology used today in the Cripple Creek and Victor mining district, high in the Colorado Rockies, bear little or no resemblance to those gold miners used there over a century ago. Located in a community whose two largest economic drivers are active gold mining and tourism, both the mining companies and the local communities are invested in preserving the history of the mining operations in the area. As the Cripple Creek & Victor Gold Mining Company expands its active operations, it is faced with the problem of how to preserve the history of the historic mining district and at the same time pursue the mineral resources providing the economic impetus for the expansion. With most of the mine expansion located outside of federal lands and federal oversight, much of the work in these areas falls outside of Section 106 compliance requirements. By supporting local museums, procuring archaeological and architectural surveys and documentation, and relocating and refurbishing historic structures and buildings, the Cripple Creek & Victor Gold Mining Company is helping to preserve the local history of gold mining, often outside of regulatory requirements, even when preservation in place is not possible.

Woehlke, Stefan (University of Maryland College Park) and Kathryn Deeley (University of Maryland College Park)

[241] A New Look at West African Spirit Practices in Annapolis, Maryland

The presence of magic practices inspired and derived from Africa is known across the Americas. They have been called Hoodoo, conjure, and West African Spirit practices in the United States and are seen archaeologically in Annapolis, Maryland from the early 18th to the 20th century. Since 1990, Archaeology in Annapolis has excavated many bundles indicative of African traditions from the City's core, what is now the Historic District of Annapolis. These bundles, derived from diverse African backgrounds, represent varied contexts, time periods, and practices that demonstrate how West African religions were adapted to new and evolving environments. These deposits are critically reexamined using recent findings while returning to theorists such as Malinowski, and Evans-Pritchard. This paper describes the range of spirituality expressed through material culture in Maryland's capital city and explains how the evolution and variation in West African spirit practices resulted from the mixing of traditions, and their application to the new and changing contexts of their forced captivity as well as freedom in Maryland's Capital City.

Wojcik, Kathryn (Portland State University) and Virginia Butler (Portland State University)

[68] Tracking Fish Response to Abrupt Environmental Change at Tse-whit-zen, a Precontact Village on the Olympic Peninsula of Northwest Washington State

Evidence of large earthquakes occurring along the Pacific

Northwest Coast is reflected in coastal stratigraphy from Oregon to British Columbia, where there also exists an extensive archaeological record of Native American occupation. Tse-whit-zen, a large pre-contact village dating between 2000 and 300 years B.P. located on the Olympic Peninsula of Washington State, was excavated with exceptionally fine stratigraphic control allowing for precise comparison of these natural and cultural records. A collaborative project is underway studying human response to environmental change through the analysis of Tse-whit-zen faunal remains, which provide a link to impacts on animal populations and in turn human subsistence. Here we report on the >10,000 fish remains from one 2x2 m excavation block; this assemblage spans several different earthquake events, allowing study of changes in relative taxonomic abundance through time that may coincide with earthquakes or other environmental changes. Results indicate use of a wide range of marine fish taxa including various sculpins (Cottidae), flatfish (Pleuronectiformes), herring (Clupea pallasii) and salmon (Oncorhynchus sp.), illustrating a highly diverse diet. Besides impacts from earthquake-related events, our study will review potential for human-caused resource depression, resource intensification, and implications for conservation biology.

Woldekiros, Helina (Washington University in Saint Louis)

[225]

Salt Trading and Interaction between the Ancient Aksumites of the Northern Ethiopian Highlands and their Lowland Pastoralist Neighbors

Salt is a commodity that has had economic, political, and symbolic value since ancient times. As a result, salt has affected local, regional and interregional relationships and contributed to complex socio-economic organization in many regions of the world. It has been hypothesized that the salt trade also played an important role in the economy of ancient Ethiopia. The restricted distribution of salt, the ecological setting and the organizational requirements of the Afar salt route would have presented early Ethiopian agriculturalists and pastoralists with a unique set of options for trade and exchange. This paper presents results from excavation and analysis of ancient caravan camp sites and settlement sites along the contemporary salt route. These results show patterned locations of camp sites, caravan trails, and caravan provisioning settlement sites following natural rivers. Material culture radiocarbon dated to this time documents the presence of grains and ceramics from the highlands and provides the first archaeological data on regional and interregional interaction through diversity in obsidian sources, ceramic types and foods consumed on the route. This paper also provides the first evidence for ancient trade on the Afar salt route.

[225]

Chair

Wolf, John

[180]

Chavín Iconographic Representations: Design Innovation, Social Dynamism and Underlying Cognitive Structures

Chavín de Huántar, temporally, is positioned at an intersection between prior systems of shamanistic belief and practice and an emerging institutionalized religion. Iconography (whether displayed on architectural features, ceramic vessels, textiles, etc.) serves as external memory stores for culturally significant representations and beliefs that are filtered by unique human cognitive abilities. "Shamans" or traditional healers and/or interpreters of natural and supernatural phenomena are accorded "authority" by their social group based on perceived achievement. This is an "authority" based on trust. The emergence of a religious elite reflects a different type of authority, one that is effectively "seized" (co-opted), held and perpetuated through social-cultural-political manipulation. This manipulation includes reference to older myths (stories) and practices (rituals). Iconographic representations are public productions that utilize a "short-hand" or mnemonic of the myth (story) and are culturally bound symbols evocative of the

myth. This paper examines particular elements of Chavín iconography, in order to identify fundamental representations and explore the pathways of design innovation, dynamism and their underlying cognitive structures.

Wolff, Christopher (SUNY-Plattsburgh) and Thomas Urban (University of Oxford)

[189]

Reimagining/Reimaging Stock Cove: A Geophysical Survey of the Stock Cove Site, Newfoundland

The Stock Cove Site of Newfoundland is a large, multicomponent, deeply stratified site containing evidence of almost every culture to have inhabited the island. Because of the richness and complexity of the site our ability to utilize it to answer specific questions can be overwhelmed by the sheer amount of material recovered in even small-scale excavations—often material not directly relevant to our more focused research questions—and the large spatial extent of the site. This can siphon time and money away from particular research goals and often runs contrary to archaeological ethics of least disturbance. For these reasons, we chose to use geophysical techniques at Stock Cove in an attempt to obtain information about subsurface cultural and natural deposits that could focus future research and minimize site disturbance. This poster presents results from a survey using ground penetrating radar and magnetometry, and includes a brief discussion of the utility of these techniques in subarctic landscapes. Multiple features and structures were discovered at Stock Cove that will help focus future research at the site and which demonstrate the growing potential of non-traditional techniques in archaeological research.

Womack, Andrew (Yale University)

[154]

Detecting Degradation in Archaeological Sites Using Satellite Remote Sensing: A Case Study on the Chengdu Plain, Sichuan, China

Over the last twenty years archaeologists have begun to utilize satellite remote sensing capabilities for identifying and mapping archaeological sites from space; few however have explored the possibilities of using this technology to monitor change in archaeological sites over time. I utilized very high resolution (CORONA; Google Earth) and medium resolution (ASTER) satellite imagery in an effort to detect change over time at eight Neolithic sites on the Chengdu Plain in Sichuan, China. First, CORONA images from 1971 are compared with modern Google Earth images to determine if site features visible above the modern ground surface have degraded over time. Second, ASTER imagery from 2001 and 2011 is classified and compared to determine changes in land use patterns around sites. Conclusions are then drawn about both the usefulness of these methods for archaeology and the state of preservation of archaeological sites on the Chengdu Plain.

Wong, Megan (University of British Columbia), Megan Wong (University of British Columbia), David Burley (Simon Fraser University) and Michael Richards (University of British Columbia)

[5]

Prehistoric Tongan Diet and Stable Isotopes: An Evaluation of Subsistence Hypotheses

There are currently two major hypotheses surrounding subsistence theory of diet in the prehistoric Tongan past. The first is referred to as the strandlooper hypothesis, which states that Lapita people focused primarily on the consumption of coastal resources with little emphasis placed on horticultural activity. The second, referred to as the horticultural hypothesis, states that Lapita people colonized the Kingdom of Tonga with a transported landscape. This transported landscape, composed of a variety of cultivated plants, would indicate a reliance on horticultural food production. This poster focuses on the evaluation of both subsistence hypotheses through isotopic investigation. Human remains, recovered from the 2007 excavation at the Tongan founder colony site of Nukuleka (2900-2850 cal BP), are analyzed

using stable carbon and nitrogen analysis. Results will be analyzed to determine the strength and validity of the two competing hypotheses.

Wong, Megan [5] see Wong, Megan

Woo, Eun Jin [22] see Jeong, Yangseung

Wood, Spencer [106] see Maschner, Herbert

Woodburn, Michael (St. Mary's College of Maryland), Liza Gijanto (St. Mary's College of Maryland) and Sarah Platt (St. Mary's College of Maryland)

[178] *"There Is no Juju, There Is only Islam": Oral Histories and Pots at Brufet, The Gambia*
Archaeologists are often faced with competing narratives of the past that lead to multiple interpretations of the archaeological record. The collective memories of the majority versus the subaltern are at odds in many contexts. In July 2012, a preliminary survey of the island of Brufet in the Foni region of The Gambia's south bank was conducted. The goal of this project was to determine the occupation history of the island derived from local oral histories suggesting that this island was the original settlement of the nearby village of Berefet. While conducting a pedestrian survey, a large quantity of ceramic sherds and several partially buried, nearly intact ceramic vessels were found and collected on the surface. When local village residents were interviewed, their answers regarding the purpose and use of these ceramics, the history of the island, and its significance within the village history as a whole varied from individual to individual based upon their relationship to the current ruling family. The relationship between these oral histories, the documentary record, and archaeological survey illuminates details not only pertaining to the history of the island, but also outlines the contemporary political relations within the modern village.

Woodfill, Brent (University of Louisiana at Lafayette)

[165] *Collaborative Archaeology and Community Development at Salinas de los Nueve Cerros, Guatemala*

In 2009, a small team of archaeologists was invited by local Q'eqchi' Maya villagers to visit the archaeological site of Salinas de los Nueve Cerros in order to begin to develop it for ecotourism. Although the site is located in Coban, one of the most populated municipalities in Guatemala, it has been largely overlooked by development projects, which have tended to focus on "rural" municipalities or on Coban's urban center, which is located over 5 hours away by public transportation. As the project has evolved, we have solidified and amplified the collaborative nature of the project through the presence of a full-time applied anthropologist and following through on a variety of development projects spearheaded by local leaders. This paper focuses on the project's successes, failures, and lessons learned over 4 years of community archaeology and development.

Woodhouse-Beyer, Katharine

[230] *Advocating Archaeology: Richard A. Gould's Contributions to Applied Archaeology and Archaeological Engagement*

Richard A. Gould's career contributions to anthropological archaeology are considerable, including his national and international archaeological fieldwork experience, significant contributions to such fields as archaeological theory, underwater archaeology, and ethnoarchaeology, and his strong dedication to teaching and mentorship. This SAA paper focuses on how Richard Gould's long-time research is theoretically and methodologically engaged - and applied. Topics of specific discussion include

Gould's work and engagement with diverse publics and indigenous peoples, as well as recent contributions to the developing field of forensic archaeology. Gould's life work and research is a testament to the importance of archaeology, and our skills as archaeologists, not only towards the investigation of past lifeways, but also, to the applied use of archaeology in the investigation and resolution of contemporary human challenges and needs.

Woods, Aaron

[218]

Fremont? Virgin Branch Puebloan Farmers? Or Something in Between? A Cross-Cultural Analysis of Material Culture and Human Remains from Parowan Valley, the St. George Basin, and the Moapa Valley

Portions of the eastern Great Basin, Colorado Plateau, southern Utah, and southern Nevada were home to two archaeologically defined groups: the Fremont and Virgin Branch Puebloan farmers. This paper focuses on the perceived cultural border between the two groups, which can be differentiated from one another by their material cultures and subsistence patterns. In this paper, we examine the frontier regions of these cultures to examine the degree of interaction in these border zones. By assessing key differences and similarities between the Fremont and Virgin Branch Puebloan archaeological records, we attempt to delineate blended and separate cultural traits which are essential for understanding the degree of cultural interaction between the two groups. We rely on both archaeological and bioarchaeological methods. Analysis of typological and stylistic characteristics of the material remains provides clues to group identity, while examination of the human remains and mortuary practices provides insight into identities of individuals within the culture.

[101] *Chair*

Woods, Aaron [175] see Toney, Elizabeth

Woodworth, Marshall [227] see Damick, Alison

Worman, F. Scott (University of New Mexico), Patrick Hogan (University of New Mexico) and Alexander Kurota (University of New Mexico)

[224] *Burned and Blown Away: Hearth-Mound Sites at White Sands National Monument*

Recent research at White Sands National Monument highlighted the importance of integrating geoarchaeological research with remote sensing, survey, and excavation in order to interpret the archaeological record correctly. The unique geology of the dunefield provides clues about the ages of sites, and geoarchaeological research helps to reveal both their landscape context when they were occupied and the resources that drew people to the area in the past. The study also has significant implications for understanding site formation processes – both those that lead to preservation and the processes that determine the trajectory of decay and eventual destruction of the traces of past occupations. Research in the gypsum dunefield presents unique challenges, and our work to overcome those challenges led to further insights that are particularly important for managing cultural resources in that environment. In addition, the data generated by our investigations are relevant to answering more narrowly geological questions. Specifically, they help to reveal the rate and timing of dune movement and the history of growth of the dunefield. Finally, there are tantalizing clues that the archaeological data might provide insight into past environmental change.

Worne, Heather [40] see Killoran, Peter

Worthington, Brian [130] see Colten, Roger

Wren, Colin (McGill University), Andre Costopoulos (McGill University) and Ariane Burke (Université de Montréal)

[215] *Putting (Hominin) Thought into Hominin Dispersal*

Typical wave of advance models of hominin dispersal focus on demographic pressure pushing hominins outwards into new regions. These models lend little agency to hominins and present them as passively diffusing randomly outwards into the surrounding environment. Even models that have included some agency have focused on environmental barriers to waves of advance. We present an agent-based simulation which gives hominins the cognitive ability to observe, assess, and select better environments. The iterative cognitive selection of improved environments results in a dispersal wave which pulls, rather than pushes hominins into new regions. We look at the relationship between environmental variables and behavior in constraining the pattern of novel environment occupation. In previous work, we looked at the optimal levels of this cognitive ability, which we call foresight, for different levels of environmental heterogeneity and cultural information sharing on dispersal rates and spatial patterning. Here we adopt an evolutionary approach which explicitly models the process through which spatial foresight would evolve as a trait, and what effect a diverse cognitive population would have on spatial and temporal patterns of dispersal. We apply the insights gained to the LGM colonization of the Iberian peninsula.

Wright, Patti [54] see Morrow, Juliet

Wright, Joshua (Stanford University)

[56] *An Island, Survey, Trees, and Pastoralists...*

Hmm, this is all a tough act to follow. This paper will address the changing cultural landscapes of the Island of Keros (Cyclades, Greece) from the Early Bronze Age to historical periods and concentrate particularly on the dynamics of the economic landscapes of the island community and the changing nature of management and administration. There will be a certain amount of practical stories about survey, some maps and landscape use models, cross cultural comparison, a moment on local food, a sidelong glance at theory and it will end with a sunset.

Wright, Rita (New York University)

[133] *Power Systems in the Indus and Near Eastern States: Testing the Limits of Corporate Political Strategies*

The breakdown of systems of rule in early states has been finely crafted. For archaeologists, the wellspring of comparative studies has demonstrated the varied dimensions of power in early states worldwide. In this paper, I examine the utility of exclusionary and corporate political strategies in the context of growing evidence for limitations of power in the Indus and contemporary states. Introduced by Blanton and his colleagues and elaborated upon in a later single-authored paper, the concept of a cognitive code and its limits to the exercise of power are explored in the context of the social patterns of production and distribution of goods in the Indus and systems of collective action in other Near Eastern states.

[245] *Moderator*

[223] *Discussant*

Wright, David (Seoul National University), Jeong-heon Choi (Korea Basic Science Institute), Jessica Thompson (University of Queensland) and Elizabeth Gomani-Chindebvu (Malawi Ministry of Tourism, Wildlife, and Culture)

[224] *OSL Dating of Landscape Change and Human Evolution in Northern Malawi*

Open-air Middle Stone Age (MSA) sites in southern Africa have

proved to be exceptionally difficult to date. The preservation of carbon necessary for 14C ages is poor and artifacts normally exceed the upper temporal limit of the method to provide a reliable age estimate. The lack of caves north of South Africa and volcanics south of Tanzania further restricts archaeologists' abilities to attain age control on site occupations. Increasing acceptance of Optically Stimulated Luminescence (OSL) as a primary dating method has opened up new possibilities for obtaining age control on MSA sites in Africa. However, OSL has been challenging to use in Rift Valley settings due to complex mineralogical attributes that have led to recurring age-underestimates relative to other geochronometers and pedogenic surfaces that affect modeling paleodose rates. This paper discusses new techniques to use OSL dating to develop an age model for archaeological settlement of Mwanganda's Village and other MSA sites in northern Malawi. Recent advances in the methodology allow a tighter age control than would have been possible a decade ago. The new data improve understandings of human cultural evolution and landscape changes during profound Middle and Late Pleistocene climatic changes.

Wriston, Teresa (University of Nevada, Reno) and Gary Haynes (University of Nevada, Reno)

[248] *Isotope Analysis of Ostrich Eggshell from Impala Shelter, Zimbabwe, and What It Tells Us about Paleoenvironments, Landscape Use, and Trade during the Holocene*

Ostrich eggshell (OES) is abundant in many sites throughout Africa and is often used to provide temporal control of archaeological and geological sites. Nevertheless, Ostrich eggshell's use as an isotopic reservoir of paleoenvironmental and tracer information remains largely untapped. In this pilot study, rodent teeth and ostrich eggshell beads, pre-forms, and unaltered fragments from Impala Shelter were analyzed for d13C, d18O, and d87Sr. These isotopic ratios reveal whether or not OES was locally obtained and whether its source region varies by stage of reduction or age. In addition, we apply this isotopic information to aide in reconstructing paleoenvironmental conditions of northwestern Zimbabwe during the mid-to-late Holocene. Results of these analyses are promising and suggest that establishing isoscapes for southern Africa will lead to new insights in Late Stone Age trade, landscape use, and environments.

Wu, Xiaohong [66] see Jiao, Tianlong

Wu, Chunming (Xiamen University)

[179] *An Archaeological Perspective on the Bronze Culture and Early Civilization of Indigenous Qi Min (七闽) in Southeast China*

The Bronze cultures of the Tieshan Type and Hulinshan Type investigated in Fujian and eastern Guangdong of southeast China could be the remains of indigenous Qi Min (七闽) which were one of a series of native ethnic groups in southeast China during the early stages of Chinese civilization. The cultural remains related to both cultural types include macro settlement patterns, stone tool workshops, ranked cemeteries, and assemblages of bronze and pottery artifacts. These remains are preliminarily dated to 3000-2400 BP and definitely less developed than those further to the north associated with the Wu Yue (吴越) and Shang & Zhou (商周) dynasties. They reflect a mixture of continuity of native traditions from local Neolithic cultures and immigration from northern states. The investigation and research on these remains, including a discussion of the chronology of these remains, show dynamics of the cultural changes of these early Bronze Age societies in southeast China and cultural interaction between the central empire and southeast shoreline region.

Wu, Xiaohong (Peking University)

[179] Radiocarbon Dating of Different Archaeological Cultures in China

The importance of radiocarbon dating begins with its current earliest effectiveness around 40/45,000 years ago and thus we can date sites that mark the onset of the Chinese early Upper Paleolithic. It is critical because the lithic industries of this period in China do not demonstrate rapid technological and typological changes as in western Eurasia. Terminal Pleistocene and early Holocene sites in the different eco-zones of China record a greater variability (such as microblades industries in the north and cobble-tool assemblages in the south) and deciphering contemporaneity and interactions are essential as several of these localities were later the first to start cultivation of millet and rice, or continue to survive on sub-tropical and tropical plant foods. The same holds for the incipient phases of animal domestication. The study of Neolithic farming societies requires the establishment of accurate chronology indicating the rhythm of the spread of the agricultural package and survival of contemporary hunter-gatherers. As village societies evolved locally forming regional cultures, knowledge of their relationships can not rely only on pottery typology and relative chronology without numerous radiocarbon dates. Publishing numerous 14C dates will improve our understanding of 'when' and 'where' the variable foundations for the Chinese civilization were laid.

Wyatt, Andrew (Middle Tennessee State University) and Joan C. Crenshaw (Middle Tennessee State University)

[57] "Our Dead Are Never Dead to Us..." Southern Maya Lowland Chultunes as Burial Chambers
Chultunes are artificially constructed underground chambers found throughout the Maya area and most commonly associated with elite and commoner residences. These chambers take different forms and are often found with a capstone either in place or disturbed by later occupants or looting. Although they have alternately been proposed as sweatbaths, fermentation chambers, or other ritual and utilitarian functions, accepted wisdom considers them as storage chambers for food or water. However, empirical evidence provides little support for this hypothesis. The size and the environment within chultunes are not conducive to the storage of food, and human remains are often found in chultunes, although they are often disturbed or filled with refuse. A more likely hypothesis suggests that chultunes functioned as artificial caves and were utilized as burial chambers for important individuals. This paper will present data compiled from chultun excavations throughout the Maya area to suggest their primary function as a burial chamber and offer a quantitative analysis of different chultun forms and associated artifacts. By presenting evidence that chultunes are ritually significant I propose that additional care should be taken during excavations, and that a greater focus should be placed on chultunes in archaeological explorations.

[57] Chair

Xiaohong, Wu [179] see Guanghui, Dong

Xie, Guangmao (Guangxi Institute of Cultural Relics and Archaeology)

[179] The Paleolithic Culture in South China
South China is a very important region in prehistoric archaeology in Asia. In this vast region, a great number of Paleolithic sites have been discovered, hundreds of thousands of stone artifacts have been recovered. They cover a time span from the Lower Paleolithic to the Upper Paleolithic age. These stone industries have common characteristics: the raw materials for making tools are cobbles mainly of sandstone, quartzite and quartz; the method for making tools is mainly direct percussion; most of the tools are often flaked unifacially; types of tools are mainly choppers, picks, scrapers, handaxes, and spheroids. Choppers/chopping tools are predominant in tool assemblage. Apart from this, differences among them are also exist. Although the stone artifacts from this region as a whole belong to the pebble tool culture, flake assemblages are also found sporadically, especially in the

northern part. The Paleolithic stone industries in South China are rather different from those in North China. However, they are close to those in Southeast Asia. This may be mainly due to the fact that in Pleistocene times, there were similar physical environments in South China and Southeast Asia, and similar environments could make human populations in different regions create similar cultures.

Xin, Jia [179] see Guanghui, Dong

Yackshaw, Sophia and Jason De Leon (University of Michigan)

[121] Necroviolence, Taphonomy, and the Ethics of Killing Animals to Understand What Happens to the Corpses of Undocumented Border Crossers

Since 2000, an average of 200 deceased border crossers a year have been recovered along the southern Arizona and Northern Mexico border. However, given that there is no systematic attempt to recover the remains of missing migrants by law enforcement, corpses are often located in remote and inaccessible areas, and bodies are often destroyed by animals or environmental conditions, this average is thought to grossly underestimate the actual number of deaths each year. As part of a 2012 field experiment to better understand the taphonomic conditions that destroy migrant bodies, three female juvenile pigs were euthanized, dressed in clothes resembling those of migrants, and exposed to different desert environmental conditions for six weeks. In this paper we highlight how this longitudinal taphonomic data has helped us to better understand the speed of decomposition, as well as the post-mortem violence (i.e., necroviolence) that wreaks havoc on the bodies of those who die in the desert. We also discuss how this experiment has forced us to engage with the ethical dilemma of attempting to study violence experienced by humans while simultaneously inflicting it upon three animals.

Yacubic, Matt (University of California Riverside) and Nate Meissner (Southern Illinois University Carbondale)

[36] Regional Trends in Obsidian Artifacts: A Look at the Central Petén During the Postclassic and Early Colonial Periods

The technological and chemical analysis of artifacts from the Maya sites of Zacpetén, Ixlú, and Nixtun-Ch'ich' has produced new information on the production, exchange, and use of obsidian artifacts in the Central Petén Basin during the Postclassic and Early Colonial periods. During this time, the ancient Maya had a complex system of local and regional economies that exchanged a wide variety of goods. Some of these items were transported over long distances by a highly organized merchant class, while other goods were locally produced and locally exchanged by individual crafters. This paper will examine the dichotomy between the local and regional economies at a time of increasing factionalism and ethnopolitical differentiation in the Petén Lakes region.

Yaeger, Jason (University of Texas at San Antonio)

[144] Household Archaeology and Population Mobility in the Mopan River Valley, Belize

Archaeologists have generally understood the population histories of Maya settlements as a series of population estimates for each time period the site was occupied. These estimates usually are based on a determination of the number of houses occupied during each period. While useful for inferring general patterns of rise and decline and for population comparisons across sites, such estimates rarely address the micro-scale differences in population histories among settlements within a polity, nor the rates of and reasons for the establishment and abandonment of settlements. This paper compares the settlement histories of two major centers (Xunantunich and Buenavista) and three smaller settlements (San Lorenzo, Callar Creek, Chan Noohol) to demonstrate the degree of variability in population histories in the Mopan valley. The broader political context of these settlements allows us to consider the origins of founding groups and destinations of those who left

these settlements, and to suggest some of the reasons for the population mobility. Clear patterns show that poorer households were more likely to abandon settlements first. Finally, the paper undertakes a finer-grained analysis of the excavation data from these settlements to reconstruct the pace and timing of the abandonment processes, and internal logics behind abandonment.

[287] *Discussant*

Yakel, Elizabeth, Ixchel Faniel (OCLC Research), Eric Kansa (Open Context and University of California-Berkeley) and Sarah Kansa (Alexandria Archive Institute (AAI) and Open Context)

[247] *Digital Archaeological Data: Curation, Preservation, and Reuse*

Archaeologists face major changes in the ways they collect, use their own and reuse others' "data" in the digital era. Spreadsheets documenting finds, digital journals linked to images of a site, CAD drawings side by side with GIS shape files documenting the site over time are all increasingly common data appearing on archaeologists' laptops. The importance of all this descriptive information is underlined by archaeology's often destructive methods and cultural property policies that may restrict the accessibility of finds for later study. On the flip side, digital data is deceptively easy to share with colleagues; yet at the same time it also creates new complexities for data reuse, i.e., the use of data by someone other than the original collector. This presentation will discuss four aspects of archaeological work that affect the reuse of digital data: documentation practices, data sharing norms, contextual information needs, and digital preservation. We will then contrast archaeologists' experiences with those of quantitative social scientists who have shared digital data for over fifty years. Our findings are based on interviews with 66 archaeologists and quantitative social scientists and the data reuse and preservation literature.

Yamahara, Toshiro [208] see Nakazawa, Yuichi

Yamahara, Toshiro

[258] *Early Pottery in East Hokkaido, Japan*

This presentation shows typological and technological characteristics of pottery and other remains at the terminal Pleistocene to the early Holocene transition in the east area of Hokkaido island, and interprets current results in terms of the relationship with the archaeological culture of the surrounding area.

Yanovich, Alexandr [69] see Lanoë, François

Yang, Dongya [38] see Hardy, Evan

Yankowski, Andrea

[249] *Salt Production in Southeast Asia: A Comparative Approach*

Using archaeological, ethnographic, historical and experimental data, this paper explores salt making in two Southeast Asian communities - one located in the Mun River Valley of Northeast Thailand and the other on the Island of Bohol in the Central Philippines. I examine the local technologies adapted in each of these communities and the environmental and social factors that have shaped the industries. I also explore the impact of these technological choices on the types of archaeological sites and artifacts we find related to salt making in Southeast Asia, and explore the social and economic impact of this industry to the development of the region.

Yao, Alice (University of Chicago)

[56] *HTW and Phenomenology*

The study of ancient settlement systems and political landscapes continues to be indebted to Henry Wright's pioneering work. The Wright approach now has a wide global footprint as his students continue to carry out this research across distant cultures and time periods. While Henry Wright has never been one for trends in archaeology, he rightly deserves credit for encouraging his students to contemplate the experiential basis of landscapes, without ever having used the P word. In particular, his emphasis on historicized landscapes, a threading rather than bracketing of historical and prehistoric settlements, alerts archaeologists to think about how actors made connections between sight and movement, past and present, space and place. This paper shows how his influence has unconsciously shaped the research program in southwestern China.

Yaremko, Jason (University of Winnipeg)

[254] *Diaspora, Transculturation, and the Layers of Indigenous Existence in the Caribbean: Cuba as Microcosm*

This paper examines three case studies in post-contact indigenous migration in the Caribbean, with a focus on three groups of Amerindian immigrant peoples - southeastern cultures (Calusa, Creek, Seminole, and other indigenous cultures), southwestern peoples (Apaches, Puebloan), and Yucatecan Mayas - and the varied forms of migration, existence, struggles, adaptation, negotiation, and persistence of various Amerindian individuals, groups and communities in colonial Cuba, toward an understanding of the dynamic and implications of this indigenous diaspora in the Caribbean Basin. In the case of Cuba, such a perspective has often been overlooked in part because of the historical acceptance and endurance of the extinction trope by most Cuban and foreign scholars (concerning both indigenous and immigrant Amerindians). In turn, this has been facilitated by an emphasis in Cuban historiography on a national history based on unity, in turn based on a theoretical racial integration ("Cubanidad" or "Cubania") that has historically restricted discussion and debate about other cultures in Cuba beyond that of Africa-Cuba, and, to a limited extent, Chinese indentured labour. Amerindian passages to Cuba - voluntary and involuntary - predated these other diaspora, eventually intersecting with them through transculturation. This study examines the "other," Amerindian, diaspora.

Yasui, Emma (University of Toronto)

[136] *Flakes as Tools: Examining Jomon Period Subsistence and Lithic Technology in Hokkaido, Japan*

This paper examines the relationship between stone tools, resources, people, and activities at the intra-site and individual dwelling level during the Jomon Period. Within this larger subject is the question of how Jomon lithic technology was incorporated into daily practices, such as the acquisition and preparation of food. In my preliminary analysis of a chipped stone tool assemblage from the Yagi site in southwestern Hokkaido, generalized flake tools appear to form a considerable portion of the lithic sample. Reports from the original Yagi Project (1978-1980) also note the systematic use of broken flakes, and the potential importance of expedient technology. The exact significance of these findings requires further attention, along with greater consideration of the wide variety of formal chipped and ground implements associated with Jomon sites. Through a fine scale approach I evaluate the place of morphology as an indicator of human activity, as well as the applicability of broader patterns in Jomon subsistence practices to particular locations in time and space. To examine these topics I combine the intra-site spatial distributions of a lithic assemblage, including ground and chipped tools, with information gained through use-wear and residue analysis of samples from pit dwellings.

Yeatts, Michael (Hopi Tribe)

[67] *Maintaining Hopi Stewardship of the Grand Canyon*

In 1991, the Hopi Tribe became involved in the development of the Glen Canyon Dam Environmental Impact Statement. This work entailed documentation of the cultural and historic importance of the Grand Canyon and its resources to the Hopi people, clans and societies. Fortuitously, this work began in the era when Bulletin 38 was hot off the press and the 1992 Amendments to the National Historic Preservation Act would soon codify the concept of a Traditional Cultural Property into the cultural resource management arena. It was also the beginning of the tenure of Leigh Kuwanwisiwma as the director of the Hopi Cultural Preservation Office. The Hopi Tribe's participation in the EIS and subsequent monitoring and management activities for the past 22 years provides a case study of the evolving roles of tribes in cultural resource management and how cultural resources are defined.

Yellen, John E. [11] see Ranhorn, Kathryn

Yerka, Stephen [188] see Wells, Joshua

Yeske, Kate (Colorado State University, CEMML) and Julie Esdale (Colorado State University, CEMML)

[88] *Archaeology and Geomorphology of Interior Alaskan Rock Shelters*

Three rock shelter sites have been identified in the Yukon-Tanana Uplands of Interior Alaska. Archaeological surveys and excavations have recovered lithic assemblages at the bases of Birch Creek schist outcrops. This poster explores site-specific rock shelter morphology and evolution that would have led to their use as prehistoric shelters. Stratigraphic data from unit excavation uncovered complex deposition revealing site formation processes. Lithic debitage analysis is indicative of projectile point re-sharpening reflecting short-term, seasonal, hunter-gatherer activity areas.

Yesner, David (University of Alaska Anchorage)

[77] *Understanding Hunter-Gatherer Behavior in Beringia: Applications of Zooarchaeological Research*

Recent zooarchaeological data from eastern Beringia allow comprehensive reconstruction of landscape perception and behavior on the part of both the initial colonists and those who recolonized after the Younger Dryas hiatus. Data from key sites in interior Alaska such as Broken Mammoth, as well as sites in the Alaska/Yukon borderlands such as the Little John site, allow reconstruction of spatiotemporal variability in subsistence and settlement, and simultaneously allow reconstruction of key elements of hunter-gatherer behavior, including settlement strategies and potential impacts on animal populations. These data can then be used to generate larger-scale theory regarding landscape use and resilience of early Beringian populations.

Yesner, David [82] see Seager-Boss, Fran

Yi, Kisung (Korea National University of Cultural Heritage, Department of Archaeology)

[22] *From Stone to Wood: Cultural Transmission of New Technologies and Changes in Tools*

Rapid changes in technologies and tools that are related to changes in a particular subsistence economy can affect major social changes. For instance, in the middle Bronze Age, people in Korea began to again use wooden hoes. This adoption is interpreted as part of the process of rapid dissemination of cultivation techniques and tools in addition to rice agricultural from

China. In contrast, stone hoes, having been employed in Korea since the Neolithic, were employed not only for farming but also for building homes. The adoption of wooden hoes was therefore a regression back to a less efficient material. It is argued here that the re-adoption of the less efficient wooden hoe is best explained by the spread of rice farming and non-selective acceptance of tools by a particular social group.

Yi, Seonbok [22] see Lee, Sang-Hee

Yi, Seonbok (Seoul National University)

[222] *Blade Industry at Rashaan Khad, Eastern Mongolia*

Testing at Rashaan Khad in eastern Mongolia revealed the existence of a blade industry by ca. 40,000 cal B.C. Although the bulk of the deposit has been severely disturbed especially by animal burrowing activities, Upper Pleistocene deposit survived partially. Unequivocal evidence of cut-marks identified from ungulate long bone fragments indicates habitual in situ butchering activities. Stone tools were made with small (usually $\geq 10\text{cm}$) chert cobbles of greenish-bluish tint derived from the bedrock. Perhaps reflecting the scarcity of raw material, even tiny chips and chunks were exploited intensively with evidence of retouch or utilization. Overall, the evidence seems to suggest that anatomically modern population were already in existence there by the beginning of the OIS 3. Given the paucity of comparable industries in Northeast Asia during the period, it might be that the bulk of the mid latitude region of the continental East Asia had been populated by modern humans rather late in time.

Yim, Robin (University of Missouri - Columbia), Rebecca E. Shattuck (University of Missouri - Columbia), Kelsi Wilson (University of Missouri - Columbia) and Kyle D. Waller (University of Missouri - Columbia)

[286] *Evaluation of Mortuary Variation and Well-Being during the Middle and Late Mississippian*

Investigating the relationship between health and social status has long been an elusive goal for Mississippian archaeologists. Mortuary variation is frequently assumed to be directly correlated with the physical well-being of an interred individual. Under this assumption, lesion frequencies have been compared among high, middle, and low-status groups. Yet, this approach may obscure subtle evidence of health inequality in non-hierarchical Mississippian societies. Here, we propose an alternative approach that draws on paleoepidemiology to reveal complex relationships between well-being and mortuary variation in the middle and late Mississippian period. We investigate the impact of mortuary variation on individuals' age at death and preexisting health conditions. Transition analysis and Gompertz-Makeham mortality models are used to estimate age-specific risks of death. Effects of covariates, including mortuary variation and lesion presence, are examined using the Usher model and Cox semi-parametric hazard models. The method proposed here allows identification of diachronic change in the relationship between mortuary practices and well-being that likely occurred in Missouri populations during the latter half of the Mississippian period.

Yoffee, Norman (UNLV UNM ISAW-NYU)

[101] *Discussant*

Yoneda, Minoru (The University Museum, the University of Tokyo), Yuichi Naito (University of Tübingen), Takashi Gakuhari (JSPS / University of Tokyo), Chiaki Katagiri (Okinawa Prefectural Museum and Art Museum) and Naomi Doi (University of Ryukyus)

[138] *Island Adaption on the Rykyu Islands from Pleistocene to Early Holocene*

The Ryukyu Islands (Okinawa prefecture, Japan) located in the most southern part of the Japanese Archipelago has a unique

history of adaption to small coral islands (> 1300 km²). We compare the historical change of subsistence on these islands by measuring carbon and nitrogen isotopes in bone collagen, in comparison with contemporaneous populations on the Japanese main island. These data show the more drastic temporal change in the subsistence on Ryukyus and their uniqueness even in both hunting-gathering-fishing and agricultural societies. The reason why people adopted the rice agriculture significantly later in this region is generally explained by the geological setting on islands, but our data show independent continuity of the adaptation strategies in the transition to agricultural societies on Ryukyus and main islands. It seems that the agriculture was reasonable only in limited areas of prehistoric Japan. Some newly found Pleistocene human remains from Ishigaki Island indicate an interesting history of subsistence development in Ryukyus in light of the maritime adaptation and human dispersal in the Pacific region.

[194] Chair

Yoneda, Minoru [194] see Shimoda, Yasushi

Yonekura, Kaoru (The University of Tokyo)

[196] *Rock Properties and Material Selection and Utilization of Flaked Tools in Paleolithic Japan*
In prehistoric Japan, shale was one of the major materials used to make flaked stone tools, along with obsidian and andesite. Although this type of rock is known to exist in a wide range of colors, textures, mineral and chemical compositions, and mechanical properties, detailed material characteristics of archaeological shale artifacts have not been analyzed so far. For a comprehensive understanding of material selection and exploitation, the composition, microhardness, and microstructures of actual shale artifacts obtained from an Upper Paleolithic site in northeastern region of Honshu were analyzed. The analysis showed that only homogeneous shale composed of a high ratio of fine α-quartz were selectively used for blade manufacture. Moreover, without exception, these materials have high hardness of approximately 7.0–8.0 GPa. These hardness values of shale blades are almost equal to those of some modern-day stainless steel knives, and additionally, they are also quite similar to those of the other major materials—obsidian and andesite. The results suggest that specific rock materials with certain compositions, structure, and mechanical properties were preferentially selected for manufacturing tools. Thus, detailed material data of prehistoric tools have the potential to give us valuable information on prehistoric material selection and exploitation.

Yoo, Yongwook (Chungnam National University)

[22] *Blank Acquisition and Its Manipulation for Making the IHRA Handaxes, Korea*
The Imjin-Hantan River Area (IHRA) handaxes of Korea are characterized by certain morphological features including, but not restricted to: (1) a very thick form with a globular base and overall limited retouch; (2) several simple (but not repetitive or consistent) percussions are performed on blanks (consisting mostly of cobbles), and this technique is responsible for the rather crude, partially bifacial, and unfinished shape (i.e., much of the cortex still remains); (3) very little consideration is given to thinning, platform preparation, and the design and shaping of the final product; (4) the direction of shaping percussion is centripetal, in contrast to the scalar/parallel direction of the classic Western Old World Acheulean handaxe; (5) its assumed function as an effective tool is questionable; given that its lateral margins do not form sharp angles, and that its pointed tip is rather an opportunistic feature rather than a deliberate outcome.

The IHRA handaxes were produced on locally available quartz and quartzite river cobbles. The poor working quality of these river cobbles might have hindered the production of suitable large flake blanks. As such, blanks were restricted to sizable cobbles; and

their high and round platform angle did not facilitate a prolonged flake removal sequence.

Yost, Chad [236] see Scott Cummings, Linda

Young, Charlotte (University of Exeter)

[29] *Spatial and Temporal Differences in Photographing Archaeological Sites in the Mid-Twentieth Century*

Archaeological landscapes captured by the camera is a significant area of research, as it is these images which have had a great impact for the visualization of archaeology, its methods and practices, according to the historical context in which the images were created and published. My PhD project questions how archaeological photographs shape our knowledge of the past, and influence our visual perceptions of archaeology as a discipline during the mid-twentieth century. Using agency theory, art theories, theories of viewing and contextual hermeneutics, my aim is to gain a greater understanding in the thought processes and scientific and artistic influences which shaped archaeological site photographs from the 1950s to 1970s, in relation to the great changes occurring in the study of New Archaeology in Britain and America. In this paper, I will discuss data gathered from several surveys on archaeological site photographs I have conducted in British and American, Classical and Prehistoric, archaeological journals during this period. The results from these surveys highlight the extent to which archaeological photographs mirror the developments and debates in New Archaeology in the 1960s, including spatial and temporal differences in the visual representation of gender, racial, colonial, artistic and scientific aspects.

Young, Tatiana (Temple University)

[197] *Architecture and Its Reflection of State Organization and Settlement Pattern in the Cochuah Region during the Terminal Classic Period*

A change in architectural style is often a result of changes in power and political organization. During the Terminal Classic Period which the Cochuah region exhibited changes in the settlement pattern, in sites layout, and in architectural components. The organization of space, directions, the location and the architectural design of buildings underwent some changes during this period. All registered sites in the Cochuah region were occupied during this period. In addition to occupation increase, the study area experienced a construction boom during this period as well. The preliminary data points out to the changes in the nature of political organization in the Cochuah Region during the Terminal Classic Period. Changes in the settlement pattern appearing during the Terminal Classic Period were produced by modification of nature of state, which was shifting from centralized to segmentary.

Youngblutt, Sarah

[7] *The Angkorean Ethnoscape: Reconciling the Disjuncture between Public Discourse and the Archaeological Record through an Analysis of Angkorean Sites of World Heritage in Thailand, Laos and Cambodia*

The Angkorian Empire has been geographically and temporally contextualized to suit political, economic and social agendas. Monumental sites of heritage as included on the 'ancient landscape' of Angkor contribute to ongoing constitutions of national, cultural and ethnic identities. A problem that exists for scholars around the world lies within the presentation of these sites themselves. As they cover an expanse including all of

contemporary Cambodia, most of Thailand, nearly half of Laos and a southern section of Vietnam, the sites have been instrumental in accommodating the production of both national and cultural discourse from a variety of stakeholders. My doctorate work studies how three nation states (Thailand, Laos and Cambodia) respond to having monumental heritage from the ancient Angkorian landscape within their borders through the analysis of multi-stakeholder discourse about both Angkorian WHS and the larger cultural landscape. I hypothesize that the activity of multiple stakeholders, who perceive and define areas of Angkorian heritage in different ways has contributed to the presentation of multiple interpretations of the Angkorian Empire, obstructing a much needed archaeological settlement analysis of the ancient Angkorian cultural landscape.

Younie, Ashlee (University of Nevada, Reno) and Kelly Edmiston (University of Nevada, Reno)

[73] *Personal Adornment of Hawaiian Cowboys: A Reflection of Occupation and Trade*

The Hawaiian cowboy – or paniolo – is a central figure in the history of ranching on the slopes of Mauna Kea on the Big Island of Hawaii, where excavation of a late-nineteenth century ranching station known as Laumai'a Cabin (50-10-24-26825) yielded a button associated with a Boston, Massachusetts brand of rain slicker designed for use in the saddle. The common addition of this imported piece of gear to the traditional, recognizable paniolo “uniform” – palaka shirt, leather leggings, and lei hatband – not only speaks to the demands of the cowboy occupation but also connects the personal adornment decisions of the anonymous, individual Hawaiian cowboy to the turn-of-the-century globalized economic system. This paper demonstrates that this button not only contributes to our understanding of its owner's occupation and participation in global trade but also his personal identity as a cowboy.

Yu, Pei-Lin (National Park Service--Rocky Mountains CESU)

[127] *Children as Formational Agents in the Archaeological Record: Some Ethnoarchaeological Observations*

Is it possible to distinguish children's behavior in the archaeological record? What roles do children play as active site formation agents and what are the implications for archaeological investigation? Ethnoarchaeological descriptions of playing, technological behavior (hand-me-down, scavenging and re-use; skill acquisition), use of space, subsistence and social roles (gender differentiation; share-out) from neotropical forager-gardeners are used to develop a frame of reference and predictive statements about archaeological correlates of children's behavior.

Yuan, Shiling [66] see Wang, Fen

Yun, Ho-Pil [289] see Lee, J. Rachel

Zapien Lopez, Victor, Alma Montiel Ángeles (INAH) and Marcus Winter (INAH)

[145] *La cerámica de las fases Bicunisa, Goma y Kuak y los orígenes del urbanismo en el Istmo Oaxaqueño*

Las recientes investigaciones indican que el urbanismo en el Istmo Oaxaqueño surgió independientemente del urbanismo en los altos de Oaxaca. Describimos la cerámica de las fases Bicunisa (500-300 a.C.), Goma (300-100 a.C.) y Kuak (100 a.C.-200 d.C.) y los patrones de asentamiento correspondientes, incluyendo el surgimiento de Tres Picos, el primer centro urbano de la región con arquitectura pública a gran escala, algunos edificios con más de 15 m de alto, juegos de pelota y múltiples estructuras habitacionales distribuidas en un área aproximada de 150 ha. Los datos indican que la región mantuvo relaciones más estrechas con grupos del sur de Veracruz y el este de Chiapas y Tabasco, esto debido posiblemente a que pertenecían a un grupo

ligado a la familia mixe-zoqueana que habitó el área.

Zaragoza, Diana (INAH)

[160] *Dzipac the Primordial God in the Huastec Region: A Study through Ceramic Representations*

The Huastec region, inhabited by several ethnic groups, shared what is considered the original god in their myths. I will refer to the symbols depicted in the ceramic corpus from the archaeological sites where the god is present. We don't know where the original is from, the time period for the initial appearance nor which of the ethnic groups worshiped first; but is still uncommon that several groups shared the same god.

Zaro, Gregory [256] see Houk, Brett

Zavala, Bridget (Universidad Juarez del Estado de Durango)

[97] *Up Above and Not So High: Setting Variation and Cerros de Trincheras in the Northwest/Southwest*

In the past three decades, researchers have documented much variability in both the temporal and geographic scope of cerros de trincheras (hills with dry-masonry walls and/or terraces) built in the U.S. Southwest and Northwest Mexico. This paper shows that there are also contrasts within the appropriation of elevated landforms and the crafting different places. Here I focus on varied aspects of daily life on elevated landforms in different valleys from Durango, Mexico to southern Arizona to demonstrate diversity in site configuration and site location. These contrasts show us that the corporalized experience of up-hill village life was different beyond regional and temporal aspects. Through architecture and the use of the natural topography the residents created particular spaces that had different meanings. The builder's choices of where to build resulted in some spaces with specialized roles at the site and river valley level which this paper tries to contextualize. Furthermore I also explore the relationship between the appropriation of elevated settings in general and the unique experience of living on particular hills.

Zavodny, Emily (Penn State University), Brendan J. Culleton (Penn State University), Sarah B. McClure (Penn State University) and Douglas J. Kennett (Penn State University)

[68] *Stable Isotope Analyses of Domesticated Animal Bone and Teeth in Croatian Archaeology*

We review the current state of stable isotope studies in Croatia, emphasizing the use of stable isotopes in domesticated animal bone and teeth to address questions surrounding their origin and spread during the Early to Late Neolithic (ca 6000-3500 BC). Ongoing isotope work on materials from Neolithic Dalmatia allows us to assess the possibilities and limitations of using poorly preserved bone for stable carbon, nitrogen, oxygen and sulfur isotope studies, and the selective use of ultrafiltration or XAD purification for certain isotope systems. We then summarize what we know and can expect to learn about the Croatian Neolithic using available methodologies.

Zeanah, David (California State University, Sacramento)

[250] *A Technological Reanalysis of the Ground Stone Technology at Puntutjarpa Rockshelter*

Ground stone artifacts are found in all three of the stratigraphic zones of Puntutjarpa Rockshelter, but both the chronology of the deposit and the functional identity of the tools as seed grinders have been challenged. Starch residues and use-polish on many of the artifacts suggests seed processing occurred throughout the Holocene. Reanalysis using technological attributes designed to monitor investment in manufacture, transport, use, and curation of milling equipment confirms that the specialized seed-grinders ethnographically associated with wet milling of seeds are absent

from the assemblage. Implications for the antiquity and variability of seed-based economies in arid Australia are discussed.

Zedeno, Nieves [64] see Montgomery, Barbara

Zedeño, María (University of Arizona) and Jesse Ballenger

[116] *Late Prehistoric Communal Bison Hunting along the Northern Rocky Mountain Front: Implications for Territory Formation among Big Game Hunters*

Detailed information on the design and construction of multiple driveline complexes with associated domestic and non-domestic facilities along the Two Medicine River Valley in north-central Montana provide a solid foundation for revisiting deeply set notions of terrestrial big-game hunter territorial organization and its social and ideological implications. We present a unique valley-scale analysis of the layout and construction of 11 complexes, which were built and utilized between ca. AD 1000–1800, and derive preliminary conclusions about the nature and politics of land tenure among communal bison hunters.

Zeder, Melinda (Smithsonian Instituton)

[212] *Niche-Construction Theory and the Broad Spectrum Revolution*

More than 40 years ago Kent Flannery coined the term Broad Spectrum Revolution (BSR) in reference to a broadening of the subsistence base of Late Pleistocene hunter-gatherers in the Near East that preceded and helped pave the way for the plant and animal domestication and agricultural emergence. Set within a demographic density model that projected differential rates of population growth and emigration in different resource zones of the Near East, Flannery's BSR quickly became a global construct linking resource diversification and intensification to imbalances between population and environmental carrying capacity. In recent years the BSR has proven especially attractive to researchers working within an optimal foraging theory (OFT) framework in which diversification and intensification of subsistence only occurs within the context of resource depression, caused by either demographic pressure or environmental deterioration. This OFT perspective is increasingly being called into question as numerous examples of diversification and intensification are being documented in contexts of resource abundance shaped, in part, by deliberate human efforts at ecosystem engineering intended to promote resource productivity. An alternative approach, framed within a newer paradigm, niche construction theory (NCT), provides a more powerful explanatory framework for the BSR in the Near East and elsewhere.

[32] *Discussant*

Zeder, Melinda [283] see Smith, Bruce

Zegarra, Edward (Binghamton University)

[268] *Ceramic Production in the Wari Heartland: The Search for an Understanding of the Relationship between Type and Function Using Statistical Analysis Programming*

Seeking to determine the relationship between vessel types and their functions, this poster will use a ceramic database from the Wari site of Conchopata as a case study to present how SAS statistical programming can be utilized to do more than group, parse, and analyze large datasets of vast collections of material remains. Examining both practical and symbolic function through the incorporation of use-wear attributes, this investigation aims to move beyond frequency of forms in assemblages to reach preliminary understandings about purpose of manufacture across an assortment of ceramics compiled over the course of 20 years of excavations at the site.

Zeidler, James (Colorado State University)

[221] *Presenting Archaeological Heritage: Identity and Interpretation in Heritage Tourism Development and Marketing*

This paper addresses the fundamental question of how the interpretive component of a large archaeological tourism project can best accommodate the often disparate knowledge base and heritage interests of potential tourists drawn from regional, national, and international contexts. In developing tourist attractions for an outdoor "archaeological park" centered on the site of San Isidro, Ecuador, a primary challenge, situated both at the local level and within the heritage tourism design team itself, has been balancing the role of interpretation based on scientific archaeological research versus interpretation based on more popular but often unscientific views of the local archaeological record. Very often, this discrepancy plays out in terms of an emphasis on archaeological contexts based on sustained archaeological research in the area, versus a focus on archaeological objects, where the latter are usually derived from looting activity and heavily inform local heritage identity. In this scenario, interpretative goals can easily bifurcate into parallel realities—one accommodating an international scientific community and scientifically informed tourists, and the other accommodating local, regional, and national heritage identities. This paper discusses how these disparate interpretive threads can be effectively conjoined into a uniform archaeological narrative through the current heritage identity politics of the Ecuadorian nation-state.

Zejdlik, Katie (Indiana University)

[57] *Modern Medical Literature and the Lived Experience of a Trophy Victim*

Both Mississippian and early modern Europeans removed ears and scalps as trophies. Clinical complications resulting from scalping and ear removal are rarely discussed in the anthropological literature. Modern medical research identifies how trauma to the scalp and ear result in physical, behavioral and emotional responses at individual, familial and community levels. Medical studies can be used as a proxy for understanding the physical experiences of past peoples who underwent similar trauma. For example, facial palsy can result from facial nerve damage during ear removal. The inability to control facial expression would have had wide ranging social effects. Additionally, early historic accounts link "brain fever", to erratic behavior and abnormal physical symptoms in scalping victims. These behaviors may be the result of subdural hematoma or meningitis caused by infection of cranial veins damaged during the traumatic event. The application of medical research in investigation of prehistoric experience provides a data supported perspective for obtaining a substantive interpretation of behavior in the past.

Zepeda, Elizabeth [63] see Sugiura, Yoko

Zhang, Grace Hua [38] see Hardy, Evan

Zhang, Hua (Simon Fraser University), Jigen Tang (Institute of Archaeology, CASS, Beijing, China), Yuling He (Institute of Archaeology, CASS, Beijing, China), Mark Skinner (Department of Archaeology, Simon Fraser University) and Deborah C. Merrett (Department of Archaeology, Simon Fraser University)

[38] *Degenerative Joint Disease of Late Shang People in Anyang, China (ca. 1250 – 1046 B.C.)*

This paper reports the analysis of degenerative joint diseases (DJD) on 350 human skeletal remains recovered from Anyang, the

capital of the Late Shang Dynasty in China. The remains span about 200 years (ca. 1250 – 1046 B.C.), but archaeologically can be divided into early and late phases. The distribution and severity of DJD were carefully documented for each skeleton as well as age, sex, and social status. Multivariate odds ratios assess differences across three age groups, eleven joint systems and two temporal phases. Our data indicate that 1) the frequency of DJD increased from early phase to late phase; 2) increase in DJD was greater in males than females, and 3) individuals of higher social status are more affected than those of lower status. This study suggests that mechanically strenuous lifestyle was significantly intensified in the late phase, consistent with worsening socio-economic conditions. While it seems reasonable to see males more affected by the laborious lifestyle, it is unexpected that people with higher social status suffered more from DJD. However, we believe that the latter may be well interpreted by the osteological paradox.

Zhang, Li

[84] *Ritual, Migrations, and State Formation in Early China: A Case Study of the Huadizui Site*

The archaeological record from Huadizui, which is located on the eastern edge of the Luoyang Basin, during the formative phase of the Erlitou culture documents a special type of event that had not existed around the Songshan region of China before then: large-scale feasting and rituals connected with sacrificing. My research has shown that artifacts from two pits at this site indicate high-class ritual paraphernalia including ritual vessels used in pairs. And another pit may be evidence of related food preparation and cooking. This is further supported by the lithic and fauna remains. This site was only used for this a very short time and thereafter seemed to be sealed for the entire Erlitou period. What is more interesting is that there is abundant evidence that the events at the Huadizui site had connections with societies from the Northern Zone. Furthermore, other sites of this period also indicate migrations from other regions into the Luoyang Basin, all of which is connected with the rise of the Erlitou state.

Zhang, Changping

[179] *Text-Based Periodization Orientation on the Study of Western Zhou Chronology*

Due to mountains of historical texts like shiji, text-based chronology in China has stretched to 841BC, late Western Zhou dynasty, and has a rough frame covered both Shang and Western Zhou Dynasties. This frame roots in the knowledge of Chinese scholars.

Before test-based dating techniques invented, Chinese scholars have already periodized Western Zhou cultures and materials like bronzes based both on style analysis and text-based chronology. Guo Moruo, a famous historian, invented so-called standard bronze dating method, dating bronzes into some kings' regime according to specific events, and also relative style of the bronzes. This method was treated as a classical chronology study in Western Zhou culture.

Text-based dating might lead chronology study to the other attending. One inscription on the bronze might indicate a specific king, but the bronze with the same style of shape or decoration doesn't refer to the same king, only refer to the similar period indeed. Dating a bronze to a king of Western Zhou dynasty, means dating the bronze to an absolute chronology instead of an archaeological relative periodization, with a doubted presumption that stylistic changes refer to the kings' regime.

Zhao, Cindy Xin [38] see Hardy, Evan

Zhao, Xin (Institute of Archaeology, Chinese Academy of Social Sciences, Beijing, China), Antonia T Rodrigues (Department of Archaeology, Simon Fraser University), Dawei Cai (Research Center for Chinese Frontier Archaeology,), Jing Yuan (Institute of Archaeology, Chinese Academy of

Socia) and Dongya Yang (Department of Archaeology, Simon Fraser University)

[68] *Ancient DNA Analysis of Domesticated Horses from Ancient China*

This research characterizes the genetics of ancient domesticated horses from archaeological sites in China in order to trace the origin and spread of horse in ancient China. DNA was successfully extracted from a total of 59 ancient horse bone or tooth samples in dedicated ancient DNA labs at Institute of Archaeology CASS, Simon Fraser University and Jilin University following vigorous protocols for contamination prevention. The analyzed DNA samples were from nine Neolithic and Bronze Age sites, including Yinxu site in Anyang. Both mtDNA and nuclear SNP markers for coat colors were targeted. The mtDNA data had a high success rate (85%), revealing 38 haplotypes belonging to 6 haplogroups; the SNP data (with limited success) showed different coat colors (chestnut, bay, black and buckskin). This on-going project will provide an excellent opportunity to compare the current generated data with previously published ancient and modern DNA data from inside and outside China to reveal changes in phylogenetic patterns through time and space in ancient China.

Zhao, Zhijun

[179] *Origin of Dryland Agriculture in North China*

China is one of the major centers for the origin of agriculture in the world. There are several independent sub-centers of origin within China, and an important one is North China along the Yellow River areas where the origin of dryland agriculture is centered, with foxtail millet and broomcorn millet the most representative crops. Flotation technique, an effective way of extracting plant remains, was introduced to and has been implemented within Chinese archaeological works in the past decade. As the result, a tremendous amount of plant remains have been recovered from many archaeological sites, including millets and other crops. The new archaeobotanic data provide direct archaeological evidence for the study of origin and development of dryland agriculture in China. This paper attempts a synthesis of these new archaeobotanic data while providing some new ideas about the origin of dryland agriculture in North China.

Zhijun, Zhao [179] see Guanghui, Dong

Zhuang, Yijie [66] see Kidder, Tristram

Ziegler, Kim Laura [260] see Conlogue, Gerald

Zimmerman, Kasia (Simon Fraser University)

[20] *"A Part of the People": Tla'amin čeʔno (Dogs) through Time*

Humans share a fascinating relationship with dogs that extends farther back in time than with any other domesticated animal. Throughout the course of this relationship, dogs have served a vast array of human needs. Archaeological investigations, ethnographic records, and oral histories indicate that Coast Salish peoples once maintained two types of dogs: the hunting (or village) dog, and the wooly dog. Tla'amin First Nations, who are part of the Northern Coast Salish peoples, had a unique type of hunting dog that was specially trained for hunting deer. The foundation for this study is the knowledge about dogs, past and present, held by members of the Tla'amin community. I documented this knowledge during an interdisciplinary fieldschool conducted in partnership between the Tla'amin First Nation, Simon Fraser University, and the University of Saskatchewan. Data from the zooarchaeological record of dog bones recovered from Tla'amin territory is integrated with community knowledge to understand how the Tla'amin human-dog relationship reflects landscape use more broadly. This study emphasizes the value of community involvement in formulating and conducting

archaeological investigations, in order to produce research that is relevant to, and valued by, community members and archaeologists.

Zimmerman, Lisa [25] see Richards, Patricia

Zimmerman, Larry (IUPUI/Eiteljorg Museum)

[118] *Discussant*

Zimmermann, Mario [113] see Fernandez Souza, Lilia

Ziólkowski, Mariusz (University of Warsaw), Fernando Astete (Direccion Regional de Cultura, Ministerio de Cultu), Slawomir Swieciochowski (Centre for Precolumbian Studies, University of Wars) and Jacek Kosciuk (Technical University of Wrocław)

[200] *Astronomy in the Inca Capital: between wishful thinking and reality*

Cusco, la capital del Imperio Inca, contenía los más importantes conjuntos ceremoniales, expresiones del sistema ideológico-religioso, base de todo el sistema de poder estatal. Una de las principales componentes de este sistema eran los conocimientos astronómicos-calendáricos, que se manifestaban tanto en la orientación específica de dichos conjuntos y/o sus elementos constitutivos, como en las actividades ceremoniales, administrativas, económicas etc coordinadas por el sistema calendárico estatal. Si las consideraciones generales presentadas en las líneas anteriores son comúnmente aceptadas por los especialistas en la materia, existen importantes divergencias entre los diferentes autores en los que toca a las manifestaciones prácticas de estos conocimientos. Dicho en otras palabras: ¿que, como y para qué fines se estaba observando en el Cusco? Unos de los temas más acaloradamente debatidos son la supuesta función astronómico-calendárica del sistema de los ceques, de la ubicación de las súncas, de la función astronómica de Coricancha etc. En el texto se abordará de manera crítica algunos de estos temas, en base a nuevas investigaciones de campo realizadas recientemente por el Autor.

Zipkin, Andrew (The George Washington University), Mark Wagner (The George Washington University) and Alison S. Brooks (The George Washington University)

[117] *The Role of Loading Agent Particle Size and Mineralogy in Formulating Compound Hafting Adhesives*

Residue analysis of stone tools from Sibudu Cave, South Africa dating to between 26-60 kya and experimental reconstructions of hafting glues have suggested that Middle Stone Age people added an ochre (iron-containing earth pigment) loading agent to the plant resin used to construct composite tools. In addition, it has been proposed that ochre particle size is a critical variable in determining the efficacy of these hafting adhesives. The study reported here addresses the effects of ochre particle size, amongst other variables, on the Work of Adhesion exhibited by adhesives based on Acacia senegal resin. Using resin, distilled water, and various loading agents, we formulated multiple adhesives and used them to construct overlap joints which were then subjected to tensile loading until failure. Quartz, clay minerals, and iron oxide ranging from clay particle to coarse sand size were evaluated as loading agents. Results indicate that iron content is unrelated to Work of Adhesion since the strongest glues contained quartz or no loading agent at all, when comparing agents in the clay-sized particle class. We suggest that the selection and transport of ochre was not driven primarily by its use as a component of hafting adhesives.

Zipsane, Henrik [72] see Hansen, Anna

Zirkle, Heidi (University of Minnesota)

[94] *Modeling Daily Patterns of Visibility Using 3D Models of Jeffers Petroglyphs*

All visitors to Jeffers Petroglyphs find that the ability to see petroglyphs changes enormously throughout the day. However, systematic recording of exactly when different petroglyphs appear and

disappear has presented significant logistical challenges. The scans from the Jeffers Petroglyphs are registered to a digital elevation model of the site, and are properly positioned in 3D space. 3D models allow for rapid processing of large numbers of petroglyphs. This paper presents results of a study exploring the effects of light direction on visibility throughout the day. First, animated movies are created using Lightwave 3D and the Sunsky Plugin to recreate the movement of sunlight across petroglyph models from sunrise to sunset. Next, frames are selected from each movie and exported as JPGs for analysis in MATLAB. Visibility is measured in terms of set thresholds of grayscale pixel values. The proportions of pixels represented in each pixel threshold are compared against other JPG frames from the movie, thus quantifying the changes in visibility of a petroglyph across a span of time. Visibility patterns are compared among the petroglyphs in selected groupings, and for specific petroglyphs during the different seasons.

Zobler, Kari (University of Illinois, Urbana-Champaign)

[285] *Identity at the Margins: Preliminary Excavation Results from the LIP (950 –1470 C.E.) Site of Talambo, Jequetepeque Valley, Peru*

Talambo was a Lambayeque and subsequent Chimú center of rural occupation and canal management located at the neck of the lower Jequetepeque Valley during the Late Intermediate Period (950 –1470 CE). In addition to its role as an important administrative settlement for coastal valley populations, the site's location at the crossroads between coast and highlands provides an important opportunity to examine sociopolitical configuration, exchange relations, and ethnogenesis in a border region. I address how rural administration and identity negotiation function in marginal regions through preliminary excavation results from the Late Intermediate Period occupation at Talambo.

Zubrow, Ezra [131] see Keeler, Dustin

Zúñiga, Belem [248] see Velazquez, Adrian

Zurita-Noguera, Judith (Instituto de Investigaciones Antropológicas UNAM), Raúl Valadez Azúa (Instituto de Investigaciones Antropológicas UNAM), Bernardo Rodríguez Galicia (Instituto de Investigaciones Antropológicas UNAM), Diana Martínez Yrízar (Instituto de Investigaciones Antropológicas UNAM) and Emilio Ibarra Morales (Instituto de Investigaciones Antropológicas UNAM)

[234] *Evidencias botánicas y zoológicas de los períodos Xolalpan tardío y Metepec en el sitio arqueológico de Teopancazco, Teotihuacan (siglos V y VI dC)*

En las investigaciones del centro de Barrio Teopancazco, Teotihuacan México, ha tenido especial relevancia el estudio de los restos animales y vegetales, que han recuperado evidencia importante sobre la organización de quienes ocuparon el sitio. En este trabajo presentamos algunos resultados de estos estudios. Durante el siglo IV dC (fase Xolalpan temprano) este espacio se especializó en la manufactura de vestimentas rituales, restos óseos (incluyendo herramientas de hueso), macrorrestos vegetales, polen y fitolitos recuperados sugieren la elaboración de adornos, tocados, pigmentos y estucos. Los restos faunísticos

y botánicos pertenecientes al final del periodo Xolalpan (segunda mitad del siglo V dC) indican cambios en la organización social y en la producción artesanal del sitio que reflejan rituales de terminación, violencia e incluso abandono. Posteriormente (fase Metepec, siglo VI dC) estos materiales muestran un nuevo orden enfocado hacia actividades domésticas y muy poca evidencia de trabajo artesanal, tal como lo manifiesta la abundancia de restos de especies locales y escasa presencia de organismos foráneos.

Zutter, Cynthia (MacEwan University) and Amy Reedman (MacEwan University)

[70] *Northern Labrador Archaeobotany: Views from Black Island*

The use of local ecology within prehistoric Inuit communities of northern Labrador for dietary and medicinal purposes, fuel, and household elements has contradicted traditional views of plant use in Northern Canadian Archaeology. How Labrador Inuit share similarities and differences in uses of local flora within and between groups, is investigated through the analysis of archaeobotanical materials from 18th-century house contexts located at the Khernertok site (Black Island, NL) and others from the Nain and Okak Regions. This project contributes to the further understanding of the traditional uses of the Arctic tundra and shrub ecology amongst the Inuit people and adds to evidence stating the significant importance of this biome to the overall subsistence of this dynamic culture.

Zwyns, Nicolas (University of California-Davis)

[222] *IUP United: Toward the Definition of a Siber-Mongol Initial Upper Paleolithic Technocomplex*

The Altai region has yielded a cluster of Late Pleistocene stratified sites that illustrate a shift from Middle to Upper Paleolithic behaviors along with the presence of at least three different hominins: the Denisovans, the Neandertals and the Modern Humans. Based on the analysis of lithic assemblages from Kara-Bom and Ust-Karakol Upper Paleolithic open-air sites, a set of techno-economic and typological features is combined and put forward to provide the Initial Upper Paleolithic (IUP) with an explicit definition. When defined as such, the IUP occurs as a chronological horizon of consistent and complex technical behaviors observed in Siberia but also in Northern Mongolia. Preliminary assemblage comparisons support the existence of a united IUP technocomplex. Furthermore, the similarities observed testify to long distance movements and/or contacts between human groups from these regions starting from the Glacial Interstadial 12. In the chrono-cultural model proposed, the IUP technology disappears from Southern Siberia and Northern Mongolia prior to the Heinrich IV cold event and is subsequently replaced by Early Upper Paleolithic assemblages starting from Glacial Interstadial 8.

[222] *Chair*

Zych, Thomas (University of Wisconsin-Milwaukee)

[25] *Stylistic and Compositional Variability in Pottery from the Northeast Platform Mound at Aztalan*

By the start of the 12th century A.D., the Aztalan Site in southeast Wisconsin was home to Middle Mississippian immigrants from the south and local Late Woodland residents. The amalgamated population coexisted, maintained defensive works, and constructed earthen monuments in the spirit of Middle Mississippian mound construction. One such mound is located within the domestic complex of the site in the northeast corner of the palisaded area. Here, Wisconsin Historical Society excavations during the 1960s produced evidence that the presumably Mississippian mound was built over an existing Late Woodland structure.

This paper explores aspects of social interactions that accompanied construction of the northeast mound, complimenting ongoing discussions regarding social identity, materiality, and diversified social relationships of the late pre-Contact period in the

midcontinent. Accordingly, this paper pairs a morphometric and stylistic analysis of pottery recovered from the mound with compositional analysis of the same materials using a Bruker Tracer III-V+ portable X-ray fluorescence (pXRF) analyzer. Results suggest construction of the northeast mound may not be a simple case of Middle Mississippian coercion or cooptation. Rather, the existing Late Woodland construction was transformed into a new space, unique to Aztalan, and to the complex social relations of the sites' hybrid population.