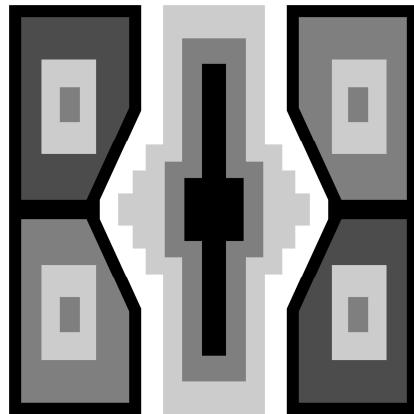


INSTITUTE

of

ANDEAN STUDIES

~ Abstracts ~



59th

Annual Meeting

JANUARY 4–5, 2019

BERKELEY, CALIFORNIA

Friday, January 4th

DANIEL CONTRERAS, *University of Maryland*

Stages, periods, and radiocarbon: 14C dating in the archaeology of the central Andes

As the quantity of Central Andean radiocarbon dates has multiplied it has become increasingly common to interpret 14C dates in aggregate as population proxies. At the same time, the use of radiocarbon dating has been tied to pre-existing cultural-historical frameworks. As a result, there is a risk that Central Andean radiocarbon assemblages are significantly biased by changing perceptions of the need for and reliability of radiocarbon dates, as well as by changing research agendas over the last half-century. This paper situates existing databases of Central Andean 14C dates in historical perspective, examining the changing foci of radiocarbon dating over time in order to assess the risks of using the Central Andean radiocarbon record as a demographic proxy.

STEPH GRUVER, *Northern Illinois University*; KURT RADEMAKER, *Michigan State University*; MATTHIEU CARRÉ, *La Universidad Peruana Cayetano Heredia*

Occupational seasonality at Quebrada Jaguay-280: Human adaptation to environmental instability

Quebrada Jaguay 280 (QJ-280) is one of the oldest maritime archaeological sites in the New World, occupied ~12,000-8,000 cal yr BP. Previous investigations suggest that the early hunter-gatherer occupants primarily relied upon marine protein for subsistence. A geochemical examination of one of the most abundant species recovered from the site, the mollusk *Mesodesma donacium*, clearly indicated a seasonal occupation at QJ-280. There were, however, subtle shifts in occupation between the Terminal Pleistocene and Early Holocene, as well as during El Niño events. The inhabitants likely adjusted their occupational patterns and seasonal routes to adapt to environmental changes and instability.

MELANIE J. MILLER, *University of Otago, New Zealand, and University of California, Berkeley*; IAIN KENDALL, *University of Bristol, England*; JOSE CAPRILES, *Pennsylvania State University*; MARIA BRUNO, *Dickinson College*; RICHARD EVERSHED, *University of Bristol, England*; CHRISTINE HASTORF, *University of California, Berkeley*

The trouble with maize and fish: Refining our understanding of the diets of Lake Titicaca's inhabitants using multiple stable isotope methods (1500 BC – AD 1100)

Previous stable isotope research from archaeological sites on the Taraco Peninsula of Lake Titicaca revealed a confounding issue of isotopic overlap between two potential dietary resources: maize and fish. Compound-specific amino acid stable isotope analysis is able to distinguish contributions from different food sources. Our results suggest that the majority of dietary protein is derived from terrestrial sources, rather than lake fish. Slight changes in carbon isotope data suggest increased maize consumption in the Tiwanaku period. Since human teeth were studied it is possible that fish were not considered food for children, or were consumed seasonally or in small proportions.

CATHY LYNNE COSTIN, *California State University, Northridge*

Revisiting north coast Formative Period shamanic practice: The prevalence of depictions of psychoactive and therapeutic substances in ceramic imagery and the case for foundational ritual power

In this paper, I argue that a larger proportion of North Coast Formative ceramic iconography reflects the consumption of therapeutic and psychoactive substances than is generally acknowledged in recent scholarship and that this iconographic corpus reflects the primacy of ritual power on the NC. First, I propose that far more of the three dimensional forms reference psychoactive substances than current interpretations enumerate and that many images allude to mental and bodily experiences associated with

altered states of consciousness. Then, I suggest that two dimensional motifs rendered in faint, postfire incisions discernable only to those in close proximity to the vessels record tightly-controlled esoteric knowledge concerning the preparation and ingestion of psychoactive substances and/or the interpretation of visionary experiences. All told, I demonstrate how ritual specialists controlled and deployed sacred imagery and ritual knowledge during the time in which social complexity first developed in the Andean region.

MIRIAM A. KOLAR, *Amherst College*

Sounding out Andean sites with conch shell horns: *Pututus* in archaeoacoustical fieldwork at Chavín and Huánuco Pampa

Conch shell horns, *pututus*, have engaged the human senses from Andean prehistory to the present. Systematic soundings of instruments in plausible use contexts permit both qualitative and quantitative description of instrument-setting-performer relationships. Embodied production of archaeological knowledge that can be heard and felt—creating sensory opportunities as well as acoustical science—connects material archaeology with various forms of understanding. In archaeoacoustical experiments with *Strombus pututus* throughout the monumental core at Chavín de Huántar, and on and around the central platform at the Inca administrative center Huánuco Pampa, archaeologically significant sound sources enliven site environments to demonstrate place-based dynamics and map communication potential.

PATRICK CARMICHAEL, *Mount Royal University, Calgary*

Of men and gods: Dramatic composition on a Nasca I ceramic drum

In the ceramic iconography of Early Intermediate Period 1 on the south coast of Peru, most vessels depict a single human or supernatural, and living human figures are seldom shown with deities. A remarkable incised, polychrome Nasca I drum at the Art Institute of Chicago displays the single largest composition of humans and supernaturals in direct association, featuring 11 elaborately costumed human figures and two Head-Taster deities. This drum marks one of the first appearances of the new Head-Taster divinity, which becomes a standard icon throughout the following Nasca sequence. Most importantly, this composition documents a decapitation ceremony to which the Head-Tasters are summoned.

ARABEL FERNÁNDEZ LÓPEZ, *Centro de Investigación Textil Chuguay*

La Señora de Cao: Nuevas interpretaciones sobre su rol y el contenido del fardo funerario

En el año 2005 el descubrimiento de una tumba de elite correspondiente al periodo Moche Temprano, en la plataforma superior de Huaca Cao Viejo, Complejo Arqueológico El Brujo (Proyecto Arqueológico Complejo El Brujo – Fundación Wiese) abrió nuevas perspectivas sobre el rol que tuvo la mujer en la sociedad Mochica. Al interior de la tumba se encontró un fardo de monumentales dimensiones, su excepcional estado de conservación permitió realizar la respectiva apertura. Para sorpresa de muchos el cuerpo envuelto en varias capas de tejidos y con diversas ofrendas, entre las que destacaron ornamentos corporales asociados inicialmente a jerarcas hombres, además de la presencia de dos cetros en forma de porra; correspondía al de una mujer, bautizada como la Señora de Cao. Desde entonces se viene sosteniendo que la Señora de Cao habría asumido el rol de gobernanta. Una relectura de las capas registradas durante la apertura del fardo, y de las tres etapas de elaboración identificadas; cada una de las cuales se distinguen claramente por su contenido, nos permite proponer una nueva interpretación del rol que cumplió la Señora de Cao y del mensaje del fardo funerario.

MERCEDES DELGADO AGURTO, *QALLTA, Centro de Investigación para la Preservación y Promoción del Patrimonio Cultural*; DANTE CASARETO MOGNASCHI, *Museo Nacional de Arqueología, Antropología e Historia del Perú*

Interpretación iconográfica de vasijas funerarias del sitio Villa El Salvador

Describimos los elementos iconográficos de vasijas asociadas a contextos funerarios recuperadas en Villa El Salvador ubicado al sur de Pachacamac. Algunos de los motivos de las vasijas tienen similitud con los registrados en la cultura Lima, otros son semejantes a elementos de las culturas Paracas y Nasca. Las características del grupo no han sido reportadas en otros lugares del área central andina. El estudio iconográfico de las imágenes es una aproximación a las concepciones que manejaban sobre la vida, muerte y ritos en torno a su medio ambiente y su interacción como grupo social durante el periodo de estudio.

CAMILA CAPRIATA, RAÚL ZAMBRANO, *Qhapaq Ñan – Sede Nacional, Ministerio de Cultura, Peru*

What really changed? Politics, religion and social interaction at an early colonial town in the Lurín Valley

Nieve Nieve, an archaeological site located in the middle Lurín Valley near Lima, was built during the second half of the sixteenth century and probably occupied longer. Although it clearly exhibits an urban plan that reflects the Spanish presence in the valley, with streets, blocks, a plaza and a church, the architecture shows syncretic elements, especially within the domestic compounds making this site unique in the region. Recent excavations and important ethnohistorical documentation reveal a complex transition period, during which the establishment of a new political, social and economic system was probably managed by local communities with little Spanish interference.

JAVIER FONSECA SANTA CRUZ (IAS 2019 TRAVEL GRANTEE), *Proyecto de Investigación Arqueológica en Espíritu Pampa*

Ocupación Wari en el Antisuyo

En 2010 descubrimos un complejo Wari importante en un sector del sitio Inca de Espíritu Pampa, la Convención, Cusco. Esta primera evidencia de ocupación Wari en el oriente andino incorpora edificios en forma D, estructuras residenciales y ceremoniales. También se encontraron contextos funerarios de la élite Wari, excavándose finos objetos de metal en oro, plata y cerámica ceremonial asociados. Uno de los individuos fue un personaje de evidente importancia religioso-político, conocido como “El Señor de Wari”. Continuamos investigando hasta 2017, evidenciándose edificaciones y material Wari colindantes a estructuras de la ocupación Inca. El 2018 proyectamos ampliar estas últimas excavaciones.

Saturday, January 5th

MARÍA CECILIA LOZADA, *The University of Chicago*; DANNY ZBOROVER, *Institute for Field Research*; ERIKA SIMBORTH, *Independent Researcher, Arequipa, Perú*; HANS BARNARD, *Cotsen Institute of Archaeology, University of California, Los Angeles*

Corral Redondo: A diachronic perspective of a ritual center in the Ocoña River drainage of southern Peru

Corral Redondo, a unique ceremonial site in the Ocoña Valley of southern Peru, was previously known only through looted materials and brief reports starting from the 1940s. The remarkable collection of textiles, ceramics, shell and metalwork of the highest quality were likely left there as ritual offerings. To define the function and structure of Corral Redondo, we conducted the first systematic excavation which confirmed the site's use by the Wari and Inca. Ceramics from lower levels further suggest that this was used during earlier periods, underscoring its unique importance as a ritual center throughout most of the Andean past.

RANDALL HAAS, LUIS FLORES, BRYNA HULL, *University of California, Davis*; NATHANIEL KITCHEL, *Dartmouth College*; TRISHA MCNEILL, *UC Davis*; BILLY MATTHEWS, *Independent*; JENNIFER CHEN, *Cosumnes River College*; RACHEL PAUL, CARLOS SANLUIS, *UC Davis*; CARLOS VIVIANO, *Independent*

Preliminary investigations of archaeological vicuña drives on the Andean Altiplano

Archaeological game drives are well documented in many parts of the world but are virtually unknown in the Andes despite millennia of large-game hunting. Using satellite imagery, we identify nearly 200 suspected game drives—V-shaped, stone-wall structures that coincide with the high-elevation habitat of vicuña. Ground observations at ten of these structures, excavations at two of them, and ethnographic observations at modern Aymara vicuña roundups suggest that the prehistoric traps were used by 30–100 individuals to hunt up to 50 vicuña in a single event. We conclude with a discussion of the implications for Andean economics.

RODRIGO ARECHE ESPINOLA, *Proyecto Qhapaq Ñan - Ministerio de Cultura, Perú*

Evidences of accounting from Huacones – Vilcahuasi, Cañete, Peru

During the Late Horizon efficient accounting practices were a key part of the Inka political economy. Throughout the conquered territories, specialists known as khipucamayocs recorded information about storage in the provinces. In this paper, I will present on the site of Huacones-Vilcahuasi in the lower Cañete Valley, on the south coast of Peru, where khipus (cords with knots that recorded information) and a yupana (instrument to calculate) were found. This paper will explore how information was processed and recorded using local accounting practices and elite complexes at Huacones - Vilcahuasi under Inka control of the Cañete region.

MARIUSZ ZIÓŁKOWSKI, *University of Warsaw*; JACEK KOŚCIUK, *Wroclaw University of Science and Technology*

Coricancha, Punchao and 3D laser scanning

Coricancha (Qurikancha, Qorikancha) was the most important temple in Cuzco, the capital of Tawantinsuyu, the Inca Empire. The Spanish Conquistadores had the opportunity to see her, and her legendary riches, in November 1533, after entering Cuzco. Coricancha was the place of worship of the most sacred effigies of the Inca cult, including the figure of the Sun, called Punchao. On this source basis, and the analysis of the remains of the original Inca Coricancha, a number of hypotheses regarding the possible astronomical function of this temple were formulated. Of particular importance was the hypothesis of R.T. Zuidema and A. F. Aveni, according to which observations at Coricancha were the structural skeleton of a specific Inca calendar cycle of 328 days. This paper presents a critical analysis of this hypothesis, based on long-term research and measurements carried out in the Coricancha by the authors of the text.

JACOB L. BONGERS, *Cotsen Institute of Archaeology, University of California, Los Angeles*

Local mortuary practice and Inca imperial conquest in the middle Chincha Valley, Peru: Continuity, change, and innovation

This paper examines how indigenous groups in the middle Chincha Valley, Peru constructed graves and treated their dead during the Late Intermediate Period (AD 1000 – 1400) and Late Horizon (AD 1400 – 1532). I report 25 14C dates associated with two grave types that vary in architecture and use: above-ground and subterranean mausolea (*chullpas*) and subterranean cists. Bayesian modeling of such dates demonstrates that local groups maintained, transformed, and innovated their mortuary practices after Inca arrival. I argue that these groups dynamically reconfigured the ways relationships among the living and the dead were performed in the face of imperial conquest.

DAGMARA SOCHA, *University of Warsaw*; RUDDY PEREA CHAVEZ, *Museo Santuarios Andinos, Universidad Católica de Santa María, Arequipa*

Capacocha from Misti: Anthropological analysis of human sacrifices

During the Misti expedition Johan Reinhard accompanied by Peruvian team, directed by Jose Antonio Chavez, discovered in 1998 the most impressive capacocha sacrifice. Because of the location of the tombs inside a volcano crater, the human remains were preserved in a poor condition. To avoid the risk of destruction, they were extracted with the surrounding soil and transported to Museo Sanctuarios Andinos in Arequipa. In February and March 2018 bodies were the focus of an anthropological study for the first time. The goal of this paper is to present the results of the research of the human remains from Misti.

GEORGI KYORLENSKI, *Cotsen Institute of Archaeology, University of California, Los Angeles*

Thinking outside the *aribalo* – Linguistic and ethnohistoric insights into Inca ontology

The Inca ceramic typologies currently in use are all based on form and decoration. Considering that classification is the first point of interpretation and not just a tool for quick processing of large ceramic data sets, these typologies are useful for a particular set of questions, while they obscure others. This paper explores indigenous ceramic classification through an examination of the early colonial Spanish-Quechua dictionaries by Domingo de Santo Tomas (1560), Anonymous (1586), and Diego Gonzalez Holguin (1607). While a complete emic typology is likely out of reach, recognizing the significance of categories such as size and material over form and decoration is critical for understanding Inca classification practices beyond ceramics.

GABRIEL RAMÓN, *Pontificia Universidad Católica del Perú*

Illustrating the Andean precolonial past: the case of Jorge Zegarra Galdós

Andean precolonial archeology is a collective product in which various characters participate from the excavation to the publication of the results. Within this group, little attention has been paid to the subaltern characters, such as illustrators and note-takers (who kept field diaries). This presentation discusses the work of an extraordinary but virtually unknown illustrator and note-taker, Jorge Zegarra (Puno 1923-Lima 1996). Based on extensive archival research, with particular focus on one of Zegarra's most important unpublished works, his "Huallamarca notebooks," this case study explores the creation of archaeological knowledge in Peru during a relatively unstudied period (late 1940s - early 1960s).

NICOLE M. SLOVAK, *Santa Rosa Junior College*; JOHN W. RICK, *Stanford University*

Investigating historic-period burials at Chavín de Huántar, Peru using radiogenic strontium isotope analysis

The current paper presents radiogenic strontium isotope ($^{87}\text{Sr}/^{86}\text{Sr}$) data for ten historic-period burials unearthed at the site of Chavín de Huántar, Peru. Archaeological, ethnographic, and osteological evidence suggest that the individuals likely date to the War of Pacific, and may represent soldiers who died as a result of the 1879-1883 conflict. Based on our $^{87}\text{Sr}/^{86}\text{Sr}$ results, we suggest that the individuals likely represent members of the Peruvian army—perhaps a contingent from the highlands given their elevated $^{87}\text{Sr}/^{86}\text{Sr}$ signatures—although the series of events that precipitated their deaths remain far from clear.

CATHERINE COVEY, *University of California, Berkeley*

Waking the puma: Urban planning and historical disorder in contemporary Cusco, Peru

In the late 20th century, Cusco, as an iconic urban center, was under debate. For the first time, the Inca/colonial core of the city was protected as a national monumental zone (1972), envisioned as an historic center (1970s-1990s), and inscribed as a UNESCO site of World Heritage (1983). Building on each other, these prototypes relied on mythohistorical understandings of the Andean past, such as the construct of Pachacuti's puma-shaped city – *pumallactan*, to authenticate new spatial order. This paper discusses how implementing the *pumallactan* provided an urban form and heritage boundary, promoted interinstitutional cooperation, and uncritically tied contemporary Cusco to its Spanish colonial past.

SATURDAY EVENING 7:30 (Open to the public)

PETER R. FUCHS, RENATE PATZSCHKE, *Free University of Berlin*; JESUS BRICEÑO R., *Ministerio de Cultura, Trujillo*

Archaeology and ritual at Sechin Bajo, Casma, Peru

Investigations at Sechin Bajo have identified a long-lasting architectural sequence of four different constructions, each built partly on top of the previous structure. The first building, a two-meter-high platform with a surface of at least 600 square meters, was erected early in the 4th millennium BC. This platform underwent five modifications with the addition of four circular sunken plazas and one rectangular sunken court in a process that represents the rise of monumental architecture in the Central Andes. Around 3000 BC, the building was carefully filled up and sealed with a compact clay floor, and a second structure was erected on top. Two other monumental structures followed until the site was abandoned around 1400 BC. This architectural sequence spanning over 2000 years not only presents a unique insight into the development of construction techniques, but also permits a close look at the emergence and changes of rituals, worldviews, and social behavior reflected in the architecture.

Posters

Posters will be on display throughout the conference in the 120 Kroeger. Poster authors will be available between 1:00 and 1:45 on Friday and Saturday.

ADAN CHOQUE ARCE, *Universidad Nacional de San Antonio Abad del Cusco*

Hombres y paisaje en el Intermedio Tardío del sur andino: Perspectivas del simbolismo de las geoformas desde el valle del Ausangate

Este abordaje interpretativo de perspectiva local, debate y reflexiona sobre los vínculos humanos y paisaje, con datos de campo y fuentes bibliográficas de origen etnohistórico, etnográfico y arqueológico, enfatizando en los significados simbólicos de las geoformas (cerros, afloramientos rocosos, quebradas, cuevas, etc.) en la cotidaneidad de grupos sociales del valle del Ausangate, al sur de los Andes cusqueños, durante el Periodo Intermedio Tardío (1000-1450 d.C.), con evidencias en la cultura material. Estas geoformas podían ser entendidas –fenomenológicamente– como personas, animales, estructuras arquitectónicas u otro tipo de entidades, relacionadas con la vida social y cotidiana, con denominaciones también análogas.

AUBREE GABBARD, CHRISTINE PINK, *Metropolitan State University of Denver*; REBECCA BRIA, *University of Minnesota – Twin Cities*; EMILY SHARP, *Arizona State University*

Juvenile age estimation in a highly commingled assemblage at Hualcayán

This study examines age distribution in juvenile remains recovered from highly commingled assemblages dating to AD 1-1450 from Hualcayán in Ancash, Peru. Specifically, this study compares age estimates based on dentition and diaphyseal long bone lengths to examine the influence of environmental stress on this juvenile population. The skeleton is more likely to exhibit disruptions in growth, thereby affecting long bone lengths. However, discrepancies between dental and long bone age estimates could be attributed to a number of variables. This study addresses the appropriateness of the methods applied while recognizing limitations from sampling bias due to commingling and site looting.

PATRICIA J. KNOBLOCH, *Institute of Andean Studies*; ELIZABETH GIBBON, *University of Toronto*; JUSTIN JENNINGS, *Royal Ontario Museum*

Who goes there? Social network analysis (SNA) of Middle Horizon (MH) identity

The identities of MH people form the database: *Who Was Who? In the Middle Horizon Andean Prehistory*, <https://whowaswhowari.sdsu.edu>. Presented are 56 identities called agents. By using the Jaccard coefficient of similarity, Gibbon constructed two social networks based on the co-occurrence of 54 agents at 33 known locations and the co-occurrence of 36 agents on common artifacts. The locational SNA challenges assumptions regarding Huari as the capital of a centralized hierarchy; rather, one player amidst several networked communities. Similarly, the communal SNA illuminates other co-occurring hierarchical relationships, thereby advancing notions of Wari power struggles possibly by engaging in cooperation or conflict.

DONNA NASH, *University of North Carolina - Greensboro*

Polishing piedras: Prestige lapidary from Cerro Baúl

Wari prestige goods include many elaborate items with polished stone inlay, such as the mosaic Wari “mirror” in the Dumbarton Oaks collection. In addition, beads of different shapes and sizes were worn as necklaces or appended to headdress as depicted on elite personages rendered in pottery and textiles. In this poster, I present evidence of the production of these types of prestige goods from the palace on Cerro Baúl. I suggest that prestige lapidary contributed to the palace political economy by creating items that could be worn or displayed by palace residents, as well as gifted to allies and subordinates.

BREIDY IVAN QUISPE VILCAHUAMAN, *University of California, Riverside*

Estimation of diet and mobility at the archaeological site of Arhuaturo, Peru

This study estimates diet and residential mobility using isotopic ratios of carbon ($\delta^{13}\text{C}$), nitrogen ($\delta^{15}\text{N}$), oxygen ($\delta^{18}\text{O}$), strontium ($^{87}\text{Sr}/^{86}\text{Sr}$) and lead ($^{20\text{n}}\text{Pb}/^{204}\text{Pb}$) in four individuals ($N = 4$) excavated at the archaeological site of Arhuaturo, Peru. $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ isotopic values indicated a mixed diet of C3/C4 plants and animal protein in samples BQ10 and BQ10-2 and mostly C3 plants in samples BQ07 and BQ17. Meanwhile, strontium ($^{87}\text{Sr}/^{86}\text{Sr}$) and lead ($^{20\text{n}}\text{Pb}/^{204}\text{Pb}$) isotope values identified at least one possible immigrant in the Mantaro region. Hence, this research provides new isotopic data to collaborate with previous studies in the Mantaro valley.

BETH KOONTZ SCAFFIDI, KELLY KNUDSON, *Arizona State University*

The Andean Paleomobility Unification (APU) Project: Strontium and Oxygen isoscapes from skeletal data and field data collection strategies

Isotope biogeochemistry is used to “geo-locate” provenience of individuals and artifacts; however, accuracy is limited by the resolution of baseline isoscape models. Over the next two years, the APU project will improve strontium and oxygen isoscape models by systematically sampling 10 major river valleys in Peru during dry and wet seasons. Here, we present cross-validated strontium and oxygen isoscapes generated from archaeological data and define local ranges with geostatistical methods. We also introduce the APU database and orient collaborators to this platform-agnostic, mobile, cloud-based, participatory GIS which will be used to collect baseline samples to fill gaps in existing data.

SYLWIA SIEMIANOWSKA, *Institute of Archaeology and Ethnology, Polish Academy of Sciences*; MACIEJ SOBCZYK, *University of Warsaw*

Between ceremony and daily life: The Inca and local pottery from the religious and administrative center of Maucallacta-Pampacolca, Peru

During the twenty years of excavations carried out at the one of the most important settlements in Cuntisuyu, related to the cult of the Coropuna volcano, an impressive amount of two hundred thousand pieces of ceramics was found. Most of these fragments have been discovered in the middens located exactly in the lower part of the Ushnu next to Platform I. Despite the evident ceremonial context, the majority of ceramics is represented by undecorated pieces. A similar situation can be observed in other contexts at this site. The aim of the paper is linking the studied ceramics from various contexts (tombs, mausoleum, middens) with ceremonies and showing its diversity.

LAUREN TERRY, CHRISTINE PINK, *Metropolitan State University of Denver*; EMILY SHARP, *Arizona State University*; REBECCA BRIA, *University of Minnesota - Twin Cities*

Identifying patterns of sexual dimorphism in commingled assemblages: A pilot study using the proximal tibia

This research examines the possibility of estimating sexual dimorphism from a sample of 36 tibiae recovered from mortuary contexts at Hualcayán, an ancient settlement in highland Ancash, Peru. The assemblage dates to AD 1-1450 and is derived from heavily looted and commingled contexts. In this pilot study, finite mixture analysis was used to identify a bimodal distribution with two underlying normal tibial plateau breadth distributions. This analysis returned promising results as a means for examining sexual dimorphism in looted and commingled skeletal assemblages, which to date have been little studied in the north-central highlands of Peru.

CASTO VOCAL, KAMPAT ANARWAT, TOM BALDWIN, EMILY HARRISON, ROBERT JAMES, PETRIC MARCINKOWSKI, JACK PORTHOUSE, *Teesside University*

Tiwanaku Valley Virtual Reality Visualization Project

This poster will present a preliminary visual modelling of the civic and residential structures of the Tiwanaku and Chiripa settlements carried out by the Virtual Reality Visualization Group of Teesside University. The project utilizes video game and VR technology to create an immersive experience for the viewer. The use of an HTC Vive Head Mounted Display will enable real time exploration of the architectural structures situated within a 3D simulation of the natural landscape. These environments will serve to highlight the relationship between the built environment, natural landscape, and the ancient peoples of the Tiwanaku Valley.

KENNETH R. WRIGHT, *Wright Water Engineers*; RUTH M. WRIGHT, *Wright Paleohydrological Institute*

Moray: A ceremonial site

The Inca archaeological site of Moray in Peru's Sacred Valley has a unique design of circular terraces along the slopes of four karst sinkholes. The site was long described by tour guides and others as an "agricultural research station" to address the mystery of why the Inca built it. However, the research of engineers and scientists with Wright Paleohydrological Institute has demonstrated that the site could not have been an agricultural research station—various factors that would have been necessary for this to have been the case simply do not exist there. Our poster will demonstrate the various reasons why we do not believe Moray was a research station and why we think it was a place for religious ceremonies.