



30TH ANNUAL

**Northeast Conference on Andean
Archaeology & Ethnohistory**

Hosted by the Robert S. Peabody Museum of Archaeology

Program and Abstracts

Saturday, October 15, 2011
8:30 a.m.–5 p.m.

Sunday, October 16, 2011
8:30 a.m.–12:15 p.m.

Kemper Auditorium



Phillips Academy
ANDOVER

**The 30th Annual Northeast Conference on Andean Archaeology and
Ethnohistory**

October 15-16, 2011

**RS Peabody Museum of Archaeology
Phillips Academy
Andover MA**

The organizers thank Phillips Academy and the Robert S. Peabody Museum of
Archaeology for hosting the conference

Schedule for 30th Northeast Conference on Andean Archaeology and Ethnohistory

RS Peabody Museum, Andover, MA, October 15-16, 2011

Saturday October 15, 2011

Kemper Auditorium

8:00-8:30 AM	Coffee, registration
8:30-8:35 AM	Welcome
Session 1	Moderated by Dan Sandweiss
8:35-9:00 AM	<i>Apsara Iyer</i> : The Impact of Archaeological Tourism on Indigenous Communities in Peru
9:00-9:25 AM	<i>Karl Zimmerer, Martha Bell</i> : Javier Pulgar Vidal's Models and Mapping of Land Use, Landscapes, and Environmental Diversity
9:25-9:50 AM	<i>Paul Szpak, Fred J. Longstaffe, Jean-Francois Millaire, Christine D. White</i> : Llama Dung and Seabird Guano: Isotopic Perspectives on Andean Fertilizers from Field and Growth Chamber Studies
9:50-10:15 AM	<i>Camille Myers Breeze</i> : A Program Summary of the Ancient Peruvian Textiles Workshop, 2004-2010
10:15-10:45 AM	Break
Session 2	Moderated by Apsara Iyer
10:45-11:10 AM	<i>Amy B. Groleau</i> : Conchopata's Ceramic "Trophy" Heads: Breaking and Curating Anthropomorphic Vessels in A Wari City
11:10-11:35 AM	<i>Benjamin Alberti</i> : Cut, Pinch and Pierce: Image as Practice among the Early Formative La Candelaria, first millennium AD northwest Argentina
11:35 AM -noon	<i>Kimberly L. Jones</i> : Wrinkled Faces and Captive Victims: Rethinking Early North Coast Ideology
noon-1:15 PM	Lunch break
Session 3	Moderated by Kurt Rademaker
1:15-1:40 PM	<i>Monica Barnes</i> : Craig Morris's Storage in Tawantinsuyu: The Lost Illustrations
1:40-2:05 PM	<i>Susan deFrance, Sofia Chacaltana</i> : The Inca Empire and Local Culture in Far Southern Peru: Settlements at Tambo Tacahuay and Punta Picata
2:05-2:30 PM	<i>Javier Fonseca E., Julinho Zapata R., Patricia Knobloch, William H. Isbell</i> : "Señor Wari de Vilcabamba": Description and Implications
2:30-2:55 PM	<i>Donna Yates</i> : Now Who Owns the Past?: Bolivian Autonomies, Antiquities Trafficking, and How Archaeologists Should Speak to the State Department
2:55-3:15 PM	Break
Session 4	Moderated by Ana Cecilia Mauricio
3:15-3:40 PM	<i>Ryan Clasby</i> : Preliminary Excavation Results from Huayurco, a Late Initial Period/Early Horizon site in the Northeastern Slopes of the Peruvian Andes

3:40-4:05 PM *Nathan Craig, Jalh Dulanto*: Preliminary observations from new research at Formative Period archaeological sites in the Paracas National Reserve, Peru

4:05-4:30 PM *Margaret Brown Vega, Nathan Craig*: Patterns of Coastal Fortification: New Data from the Central Coast of Perú

4:30-4:55 PM *Ana Cecilia Mauricio*: The Huaca 20 Archaeological Site: Household Activities, Funerary Practices and El Niño Effects on a Late Lima Site

4:55-5:00 PM **Business Meeting**

6:00 PM **Reception at R.S. Peabody Museum**

7:00 PM **Dinner at Paresky Commons**

Keynote lecture by Richard Burger on Hiram Bingham and Machu Picchu

Sunday October 16, 2011

Kemper Auditorium

8:00-8:30 AM **Coffee**

Session 5 **Moderated by Elizabeth J. Olson**

8:30-8:55 AM *Alice R. Kelley, Dan Sandweiss, Joseph Kelley, Daniel Belknap, Kurt Rademaker, Elizabeth Olson, Ana Cecilia Mauricio, David Reid*: Los Morteros: Ground-Penetrating Radar Looks Inside A Peruvian Pre-Ceramic Mound

8:55-9:20 AM *Benjamin Vining*: Refugia-effects and stability in small-scale systems: implications of new archaeological survey and palaeoclimate data from el Proyecto Arqueologico Lago Suches

9:20-9:45 AM *Luke Wildfire, Richard Miksad, Alexei Vranich*: A Paleo-Hydrologic Analysis of Rainwater-Runoff and Drainage of the Incan Ruins of Saqsaywaman, Cusco, Peru

9:45-10:10 AM *Constanza Ceruti*: Challenges and Achievements in the Praxis of High Altitude Archaeology in Northern Argentina: A Personal Perspective

10:10-10:30 AM **Break**

Session 6 **Moderated by David Reid**

10:30-10:55 AM *Elizabeth J. Olson*: Geoarchaeology of the Salinas de Chao Paleo-embayment

10:55-11:20 AM *Lucas C. Kellett, Brian S. Bauer*: Long-Term Obsidian Procurement Strategies in the Andahuaylas Region of Southern Peru

11:20-11:45 AM *Kurt Rademaker, Bruce Kaiser, David Gibson, Michael D. Glascock*: New Geochemical Data from the Alca Obsidian Source Region: Implications for Understanding Prehistoric Extraction and Distribution

11:45 AM -12:10 PM *James B. Richardson III*: In the Wake of Kon Tiki: Thor Heyerdahl and Andean-Polynesian Contact 64 Years Later

12:10-12:15 PM **Closing remarks**

**Abstracts for the 30th Northeast Conference on Andean Archaeology and
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Cut, Pinch and Pierce: Image as Practice among the Early Formative La Candelaria, first millennium AD northwest Argentina

Benjamin Alberti (Framingham State University)

Visual imagery can be understood to work in a number of registers. Most commonly, archaeologists have taken it as symbolic expressions, inventive ways to substitute for language or communicate ideas. Similarly, imagery can be understood to be organized in an isomorphic sense to social structure. There is also the question of how imagery actually works: what is it that moves us or works on us? Cognitive impact, conceptual play, or the affect of the abduction of complex intentionalities are some candidates.

Which register is appropriate for understanding the material that interests me, anthropo and zoomorphic imagery from first millennium northwest AD Argentina? What such approaches share in common is a focus on a particular type of audience and a finished object—on the effect of a completed work or image on a separated subject or recipient (“patient”). There is latent, however, another possibility: that the visual imagery communicated and worked at the level of practice. Interactive artworks, or work that is understood in some sense as on-going, points in that direction. I argue that the imagery in the pottery communicated not solely as a completed object aimed at a particular audience but was efficacious insofar as the practices associated with its production—and the place of those practices in a broader world of practices—were specifically embodied and understood. Drawing on Amazonian ethnography, I illustrate by discussing a parallelism between the incisions and moldings on pots and the painting of bodies, activities which can be understood as instances of non-representational image making.



Craig Morris’s *Storage In Tawantinsuyu: The Lost Illustrations*

Monica Barnes (*Andean Past* and American Museum of Natural History)

In the earliest days of the Spanish conquest of the Andes, functioning Inca storehouses at Hatun Xauxa and Pachacamac were observed by Hernando Pizarro. Since then they have never been forgotten. However, the scientific study of Inca storage facilities was launched by Craig Morris who, in 1967, successfully submitted his landmark doctoral dissertation, *Storage in Tawantinsuyu* to the University of Chicago. This influential work has served as a baseline for subsequent studies by Morris himself and by other scholars including Peter Eeckhout; Terrence N. D’Altroy, Timothy Earle and Christine Hastorf; Flor de María Huaycochea Nuñez de la Torre;

John Hyslop; Terry LeVine; Ramiro Matos Mendieta; David Pereira Herrera; Francis A. Riddell, Dorothy Menzel, and Grace Katterman; James Snead; Herman Trimborn; and Lidio Valdez, among others.

Although full of insight on the hows and whys of storage under the Incas, Morris’s dissertation is curiously lacking in illustration. It contains only eight pictures, all black and white line drawings, mostly simple partial plans and elevations, and only one plate of pottery rim profiles. Nevertheless, Morris’s correspondence refers to “thousands” of photographs and drawings made during the course of his participation in John Murra’s important “A Study of Inca Provincial Life” project, into which Morris’s dissertation research had been integrated. Murra’s own publications are also sparsely illustrated, if at all.

So what became of the Huánuco photos? At the time of the Project, from 1963 until 1966, as was then customary, John Murra, in his role of overall project director, insisted that all participants turn their photographs over to him. In 1968 Murra moved to Ithaca, New York, to take up an appointment as Professor of Anthropology at Cornell University. He brought the Huánuco negatives and photographic prints with him, keeping them in their original glassine sleeves and acidic paper envelopes. In 1998 Murra conveyed these materials, along with approximately three linear feet of Huánuco field notes, to the American Museum of Natural History, where Craig Morris was curator of South American archaeology. Late in 2009, Sumru Aricanli, Senior Scientific Assistant at the AMNH drew my attention to them.

Since then I have been ordering, studying, scanning, and annotating the Huánuco material from the mid 1960s, including the collca-by-collca excavation photographs taken by Morris while conducting the field research underlying his dissertation. In this paper I present a sample of the matches that can be made between this emerging photographic archive and specific paragraphs of *Storage in Tawantinsuyu*. Thus I am restoring the lost illustrative portion of Morris’s dissertation.



A Program Summary of the Ancient Peruvian Textiles Workshop, 2004-2010

Camille Myers Breeze

For seven years, Museum Textile Services and the Municipal Museum of Huaca Malena collaborated to offer an annual Ancient Peruvian Textiles Workshop in and around Lima, Peru. This unique independent program brought together Peruvians and non-Peruvians with the goal of conserving archaeological textiles and mummy bundles while learning firsthand about Peru’s long and multifaceted history. The Ancient Peruvian Textiles Workshop was an outgrowth of the highly successful *Adopte un Textil* program that was conceived by Rommel Angeles Falcon in the 1990s to inform institutions, scholars, and the public of the urgent need to rescue and preserve textiles from Huaca Malena. Through the efforts of ICOM-Peru and the Archaeological Project of Huaca Malena, the adoption project was a starting point for a subsequent educational program that involved the local community in the defense and protection of pre-

Hispanic textile heritage. During the ten-day Ancient Peruvian Textiles Workshop, students visited museums and historical sites, and worked together to conserve artifacts salvaged from Huaca Malena, and later Huaca Huallamarca. Students were drawn from many related fields including archaeology, conservation, weaving, and art history. They received instruction in both English and Spanish on textile structures, documentation, preventative conservation, and reversible mounting. Of equal importance, students visited the heavily looted archaeological site at Huaca Malena, and gained perspective on difficult issues like grave robbing, cultural repatriation, and the treatment of human remains. The non-Peruvian students came from the United States, Canada, France, the UK, Greece, Germany, and Norway. They provided the funding for the course and the Peruvian students attended at no cost. In January, 2008, we inaugurated the exhibit *Cinco Años de Colaboración en Conservación: Huaca Malena & Museum Textile Services*, which is still available as a virtual exhibit in both English and Spanish at www.museumtextiles.com. Over the course of seven years, the Pre-Columbian Textile Workshop taught sixty-three students and conserved over seventy artifacts. This unique experience has helped some students move ahead to graduate school, others to obtain employment in museums, and many to become more well- rounded archaeologists. All of us involved in the program changed the way we think about the challenges faced by conservators and archaeologists on a global scale.



Patterns of Coastal Fortification: New Data from the Central Coast of Perú

Margaret Brown Vega (Pennsylvania State University)

Nathan Craig (Pennsylvania State University)

This paper presents an analysis of the distribution of fortifications and hilltop defensive sites in the Huaura and Fortaleza Valleys, central coast of Perú. Recent survey documented more than 80 fortified sites in the two valleys. The two drainages differ in terms of catchment area, river water abundance, topography, and arable land. These differences permit a comparison of patterns of fort construction with respect to landscape variables. Relationships between site placement and landscape configurations, including water and agricultural land are explored. Measures of density are calculated to identify potential “hot spots” or concentrations of fortifications. Isotropic and anisotropic distance measures for travel time to water are assessed. Estimates for agricultural land are evaluated in light of fort location. Patterns by time period are discussed, and these data are placed in regional context by drawing on comparisons to other valleys.



Challenges and Achievements in the Praxis of High Altitude Archaeology |in Northern Argentina: A Personal Perspective

Constanza Ceruti (CONICET / Institute of High Mountain Research at the Catholic University of Salta)

Archaeological research is undoubtedly a meaningful endeavor; not only for the scientific knowledge produced about ancient civilizations, but also for the opportunity to contribute to the preservation of our cultural heritage for future generations. In this presentation I would like to adopt a personal perspective to share the challenges that I have faced (and to celebrate some of the achievements attained) during fifteen years of professional praxis as the only female Andean high-altitude archaeologist in northern Argentina. I am proud to be the founder and director (ad-honorem) of a small Institute of High Mountain Research at the Catholic University of Salta, Argentina; as well as the author of more than seventy academic publications, including seven books. With little support and very limited resources, I have managed to explore more than one hundred mountains above 5000 meters within the context of systematic archaeological research. I participated as project co-director in Johan Reinhard's archaeological expeditions in 1999 and 2000, funded by the National Geographic Society. On the summit of volcano Lulllaillaco (6739 m), the site of the highest archaeological work ever undertaken, Reinhard and I discovered three of the best preserved mummies in the world, together with numerous gold and silver statues and sumptuary objects of typical Inca style. In the following years, I have been involved in the coordination of the interdisciplinary research on the frozen bodies and artifacts at the Catholic University of Salta, in collaboration with scholars from Argentina, the United States and Europe. I have conducted ethnoarchaeological observations on top of Aconcagua (6962 m), in addition to being the first woman on the summit of Mt. Pissis (6882 m) - one of the two highest volcanoes in the world. For my anthropological research on sacred mountains I have ascended peaks in Ecuador, Bolivia, Peru, Chile, Mexico, Greece, Norway, Spain, Italy, New Zealand, Hawaii, Australia and Nepal. I have also documented mountain pilgrimages in the high Andes of Peru and northern Argentina.



Preliminary Excavation Results from Huayurco, a Late Initial Period/Early Horizon site in the Northeastern Slopes of the Peruvian Andes

Ryan Clasby (Yale University)

This paper presents the preliminary results of archaeological excavations undertaken at the Late Initial Period/Early Horizon site of Huayurco. Located in the lower northeastern slopes of the Peruvian Andes on a major tributary of the Marañon, Huayurco has long been thought to have played an important role as an intermediary of exchange between Northern Peru, Southern Ecuador, and the Amazonian lowlands. First excavated in 1961 by Pedro Rojas, the discovery of exotic coastal items and a local stone bowl industry led scholars such as Donald Lathrap to suggest that Huayurco actively engaged in interregional trade, helping to facilitate

the flow of information and material goods between coastal, highland, and lowland populations. Nevertheless, despite the site's potential for understanding early interregional relationships during the Formative Period, few attempts were made to follow up the claims that arose from Rojas's initial investigations. Recent excavation results, however, have begun to clarify the nature of the community that existed at Huayurco and the type of interregional relationships in which it engaged.



Preliminary observations from new research at Formative Period archaeological sites in the Paracas National Reserve, Peru

Nathan Craig (Pennsylvania State University)
Jalh Dulanto (Pontifica Universidad Católica del Perú)

Beginning in 2010, a new campaign of field research was undertaken at several archaeological sites in the Paracas region. These sites are: Disco Verde, Puerto Nuevo, Chucho, and Karwa. Research began with mapping and kite aerial photogrammetry. This work resulted in detailed 3D characterization of the present surface condition of these sites. During the 2011 field season, ground penetrating radar and excavations were undertaken at Karwa. This research resulted in a refined understanding of the formation of the major mound features and the recovery and documentation of an intact tomb. While fieldwork and laboratory analysis are ongoing, we provide some initial impressions and raise questions for future research.



The Inca Empire and Local Culture in Far Southern Peru: Settlements at Tambo Tacahuay and Punta Picata

Susan deFrance (University of Florida)
Sofia Chacaltana (University of Illinois-Chicago)

Inca settlement of southern coastal Peru at the sites Tambo Tacahuay and Punta Picata document empire expansion and the subjugation of the local Chiribaya and/or Gentilar populations. At Tacahuay Tambo the Inca constructed a small stone-masonry tambo approximately two kilometers inland in the indigenous community. Excavations demonstrate Inca success in co-opting and amplifying the local agricultural system, particularly for the production of cotton. Additionally, the Inca appropriated local ancestors through the introduction of highland chulpas for burial. At the Tambo our work also demonstrates the difficulty in discerning how Inca activities altered non-agricultural systems of production and the local political structure. Punta Picata, located approximately seven kilometers south of the Tambo, is a specialized fishing village with evidence of ephemeral Inca occupation. This locale was hypothesized to have been an area for intensification of fish production during Inca times. Testing at Picata documented cane-walled domestic architecture, conquina-lined tombs, and a quarry for the extraction of large breccia slabs used in tombs. We discuss our preliminary

findings from both sites and implications for understanding Inca settlement of far southern Peru.



“Señor Wari de Vilcabamba:” Description and Implications

Javier Fonseca E., Julinho Zapata R., Patricia Knobloch, William H. Isbell (Binghamton University – SUNY)

Discovery of a burial, the “Señor Wari de Vilcabamba,” was announced this year by its excavator, Javier Fonseca, and Peru's Ministerio de Cultura, Cusco. This paper describes the discovery for an archaeological audience, evaluating its Wari identification, and exploring its implications. Where was this tomb discovered, and what was found? To what other archaeological materials do the discoveries relate? Is a Wari presence confirmed in the Vilcabamba region, and if so, what was its nature? What are the greater contexts of this discovery? What new implications are indicated for Middle Horizon relations between Wari, the Vilcabamba region, and the greater Cusco area? What does the discovery tell us about Wari and the Andean Past? This paper describes the new discovery and considers what it means for Andean prehistory.



Conchopata’s Ceramic “Trophy” Heads: Breaking and Curating Anthropomorphic Vessels in A Wari City

Amy B. Groleau (Colgate University)

A systematic study of 44 unique architectural spaces at the Wari site of Conchopata links the familiar ritual of smashing large numbers of anthropomorphic jars and icon-laden urns with a newly-identified practice of distribution and curation of selected fragments of these vessels, showing a noted preference for heads. Through an examination of 126 sub-floor pit features, notions of Wari ritual practice are expanded beyond ceremonial objects of restricted circulation to mixed assemblages of pottery production tools, sacrificed animals, and fragmentary objects. Rather than an offertory practice, I suggest that these pits are material histories of household engagement with the larger community and with city religious and political life.



The Impact of Archaeological Tourism on Indigenous Communities in Peru

Apsara Iyer (Phillips Academy)

My research sought to identify the relationship between local peoples and archaeological sites and to determine to what degree archaeological tourism affects this relationship. During July

2011, I interviewed vendors, tourists, and locals living around 9 different archaeological sites in the Cusco District of Peru. A linear regression analysis of my data provided information on the interconnectedness of economic potential, cultural awareness, and local organization. My conclusions present the most significant factors contributing to the relationship between local peoples' and archaeological sites, as well as how site size affects the outcome. A secondary focus on legends as an indicator of cultural awareness at archaeological sites allowed me to evaluate the way in which communities develop individualized legends and beliefs.



Wrinkled Faces and Captive Victims: Rethinking Early North Coast Ideology

Kimberly L. Jones (The University of Texas at Austin)

Modeled Cupisnique stirrup spout bottles from the north coast of Peru evince the development of an elaborate iconographic program during the Middle Formative Period (1200-800 BCE). The most cited ceramic bottles represent stylized feline figures and columnar cacti, which have led to interpretations regarding shamanic transformation as a key aspect in Cupisnique culture. The abundance of isolated human heads incised on bottles, however, forces consideration of a more complex iconographic system. In order to address the symbolic role of the ceramic corpus, I focus on the limited but consistent set of anthropomorphic representations.

The anthropomorphic forms adopt repeated types of postures, such as seated with objects in the hands or kneeling with hands tied behind the back – as captive victims. These individuals are visibly linked by the lack of adornment, a top-knot hairdo or heavily incised lines patterned across the faces. In contrast to the increasingly adorned individuals illustrated into the later Formative Period, these early wrinkle-faced figures may critically mark the evolution of a developing ideological system. Their presence and function in Middle Cupisnique iconography, in fact, may suggest the foundation of key concepts regarding ritual capture and sacrifice that are increasingly central to scholarly discussion about the north coast of Peru and the successive Moche culture.



Long-Term Obsidian Procurement Strategies in the Andahuaylas Region of Southern Peru

Lucas C. Kellett (University of Maine at Farmington)

Brian S. Bauer (University of Illinois at Chicago)

This paper attempts to fill an important geographical gap in regional obsidian studies by reconstructing long-term prehistoric obsidian procurement and consumption patterns in the Andahuaylas region of southern Peru. A total of 93 obsidian samples from two recent projects in the region were analyzed using portable X-ray fluorescence spectrometry (PXRF). The results offer two important insights, the first being the long-term importance of the Potreropampa source to populations of the Andahuaylas region. Second, the data indicate that obsidian

procurement strategies changed course during the Chanka Phase (AD 1000-1400) with an increase in overall source diversity. The results also tentatively suggest a shift in importance (or overall access) of regional obsidian sources when we compare samples from earlier and later occupied Chanka Phase hilltop sites.



Los Morteros: Ground-Penetrating Radar Looks Inside A Peruvian Pre-Ceramic Mound

Alice R. Kelley, Dan Sandweiss, Joseph Kelley, Daniel Belknap, Kurt Rademaker, Elizabeth Olson, Ana Cecilia Mauricio, David Reid (University of Maine)

Reconnaissance level ground-penetrating radar (GPR) investigations in 2006 indicated a human origin for the large (100m x 25m) mound located on a mid-Holocene, raised paleoshoreline in the Salinas de Chao in north, coastal Peru. Midden deposits previously identified by earlier workers as cultural material capping a relict sand dune or sand-draped bedrock mound, are now regarded as deposits that represent one of the last occupations of a site constructed before 5000-5400 cal yr BP (Sandweiss et al., 2010). These data suggest that the mound is among the earliest monumental structures constructed in prehistoric South America. Interpretation of a portion of nearly 25 km of GPR profiles collected in 2010 are revealing more information about the organization of the feature and internal structures, such as rooms and walls, and providing insights to the cultural complexity that once existed in this now hyper-arid desert environment.

Sandweiss, D., Kelley A.R., Belknap, D., Kelley, J.T., Rademaker, K., and Reid, D., 2010, GPR Identification of an Early Monument at Los Morteros on the Peruvian Coastal Desert, *Quaternary Research*, 73:439-448.



The Huaca 20 Archaeological Site: Household Activities, Funerary Practices and El Niño Effects on a Late Lima Site

Ana Cecilia Mauricio (University of Maine)

Huaca 20 is an archaeological site that is now located inside the campus of the Pontificia Universidad Católica del Perú, in the city of Lima. This site was a Late Lima (Early Intermediate Period) domestic unit within the Maranga Complex (the core of the Late Lima society located in the lower Rímac Valley), occupied between 550 and 750 A.D. Archaeological excavations at Huaca 20 unearthed evidence relating this site to fishing and shell-gathering as its main economic activities. This domestic occupation of Huaca 20 was challenged at some point during the Late Lima occupation by a severe flood and strong rainfalls that brought flooding, erosion, and alluvial deposits, causing the destruction of an important part of the site. After visible efforts to maintain the function of this site, Huaca 20 became a funerary area where, so far, ca. 200 tombs have been related to this phase. Not long after this funerary moment, Huaca 20 was

again used as a domestic unit; during this phase Late Lima ceramics appeared along with Nievería pieces in cultural deposits and tombs. Archaeological excavations carried out between 2005 and 2009 have yield information, supported by stratigraphic, architectural, botanical, ichthyological, malacological, ceramic and funerary evidence; about complex processes taking place in Huaca 20 before, during, and after a major natural catastrophic event (El Niño). This evidence illustrates human-environment dynamics that occurred at the end of the Early Intermediate Period and its relation to the end of the Lima society on the Central Coast of Peru.



Geoarchaeology of the Salinas de Chao Paleo-embayment

Elizabeth J. Olson (University of Maine)

Los Morteros is a large (225 x 200 x 14.5 m) mound that is potentially one of the oldest monumental structures in the Andes, with dates between 5500 and 5000 cal BP from immediately sub-surface deposits. Located in the Chao paleoembayment, the mound’s western edge overlays the paleoshoreline escarpment. Geological fieldwork on the Salinas de Chao Paleo-embayment during the Summer 2011 obtained new data, which chronicles the changes in sea-level through time. This project provides new in site into the environmental evolution of the landscape. By coupling this new data with preexisting archaeological data a holistic view of the Chao Valley PreCeramic populations can be obtained. This preliminary report exhibits the potential of research programs coupling environmental and archaeological data.



New Geochemical Data from the Alca Obsidian Source Region: Implications for Understanding Prehistoric Extraction and Distribution

Kurt Rademaker (University of Maine)
Bruce Kaiser (Bruker Elemental)
David Gibson (University of Maine at Farmington)
Michael D. Glascock (University of Missouri)

From initial use by Late Pleistocene hunter-gatherers to widespread distribution by complex societies, Alca obsidian was one of the most economically important volcanic glasses throughout Central Andean prehistory. Alca is the only Peruvian obsidian known to have geographically patterned geochemical variation within an extensive source region. This characteristic allows high-resolution provenance determination of artifacts and makes the Alca source an ideal place to evaluate various extraction and distribution scenarios. We present new geochemical data obtained on obsidian artifacts from archaeological sites local and extra-local to the Alca source region and discuss potential social and economic implications.



In the Wake of Kon Tiki: Thor Heyerdahl and Andean-Polynesian Contact 64 Years Later

James B. Richardson III (Carnegie Museum of Natural History)

In the minds of many archaeologists, Thor Heyerdahl is viewed as an adventurer whose theories of trans-oceanic contact have little substance. In this presentation I will show that Heyerdahl adhered to archaeological standards in his research through the assembling of professionals to conduct excavations at such sites in Easter Island and at Tucume. In his *American Indians in the Pacific* (1953), he provides an in-depth review of the capabilities of Andean mariners for ocean travel that will be updated with a discussion of Precolumbian long distance ocean travel from the Andes to West Mexico and the probability of voyages into Polynesia. There has been a resurgence of interest in contact between the Andes and Polynsia which includes evidence of an Hawaiian introduction of the plank canoe to the Chumash of California, the presence of Polynesian chickens in Chile and Andean DNA in the Easter Island population. This renaissance on research into trans-Pacific contact with the Americas has culminated in *Polynesians in America: Pre-Columbian Contacts with the New World* (2011). Although it is clear that there was contact between these two regions by boat, the question remains, is there any evidence of a lasting impact reflected in Andean societies as there was in Polynesia after the introduction of sweet potato?



Llama Dung and Seabird Guano: Isotopic Perspectives on Andean Fertilizers from Field and Growth Chamber Studies

Paul Szpak, Fred J. Longstaffe, Jean-Francois Millaire, Christine D. White (The University of Western Ontario)

This study presents stable isotope ($\delta^{13}\text{C}$ and $\delta^{15}\text{N}$) and vital data for maize (*Zea mays*) fertilized with Peruvian seabird guano and llama dung; plants were grown under field (agricultural plots near Guañape, Peru) and controlled (growth chamber) conditions. A massive enrichment in ^{15}N characterized both the growth chamber and field grown plants fertilized with seabird guano (>20%), while the llama dung fertilized plants are characterized by a more moderate enrichment in ^{15}N (~2%), similar to what has been observed for European crops fertilized with livestock manure. We discuss these results in light of the interpretation of human dietary practices in the Andes, as well as the potential of detecting these fertilization practices using isotopic data. In addition to these isotopic patterns, there are numerous changes in the routing and accumulation of plant metabolites, plant growth and fungal growth that were documented as a result of fertilization. We discuss the implications of these factors with respect to prehispanic agricultural practices in the Andes.



Refugia-effects and stability in small-scale systems: implications of new archaeological survey and palaeoclimate data from *el Proyecto Arqueologico Lago Suches*

Benjamin Vining (Boston University)

Recent results from archaeological survey and palaeoclimate analysis from the Lake Suches basin reconstruct the Holocene human and environmental history for a portion of the southern Peruvian highlands. After considerable environmental flux in the early Holocene, conditions become markedly stable. Precipitous changes in settlement patterns and land-use strategies at the Formative – Middle Horizon tradition and in subsequent phases occurred in a context of notable environmental stability, even for this marginal region, and can be attributed to economic motivations. These new data show an added dimension to culture and climatic dynamics, where stability in small-scale social and environmental systems moderated some of the more dramatic shifts for more regional systems that are recorded in the south-central Andes. These local scale systems functioned as environmental and social *refugia*, promoting regional stability.

Discrepancies between Suches archives and comparable regional datasets bring to the fore issues of system scale and environmental thresholds at which changes of state occur. These findings question the universality of severe draw-downs documented in Lake Titicaca and used commonly as a proxy for the socio-political stress caused by environmental drivers in the prehispanic period. Further, stability in rural land use patterns suggest that smaller scale societies, like smaller scale hydrological systems, were more adaptive and able to absorb moderately oscillating environmental conditions, resulting in a constant organization. Findings from the Suches investigations suggest that system-scale is an important factor in response to changing conditions, and that smaller systems can absorb more variation before thresholds provoking changes in state are reached.



A Paleo-Hydrologic Analysis of Rainwater-Runoff and Drainage of the Incan Ruins of Saqsaywaman, Cusco, Peru

Luke Wildfire (Virginia Tech University)

Richard Miksad (University of Virginia)

Alexei Vranich (University of California Los Angeles)

At popular archeological sites in Peru, long-term sustainability is often threatened by the conflicting goals of development and conservation. Symptomatic of this struggle, tourism-centric alterations to the drainage of the Inca ruins at Saqsaywaman (Cusco, Peru) have contributed to the damage of its iconic walls including widespread loss of structural integrity and a dramatic section collapse in January 2010. Our cross-disciplinary team of engineers and archeologists investigated these problems with a hydrologic rainwater runoff analysis by using field surveys and topographic data from the Instituto Nacional de Cultura (INC). We found that modern drainage modifications to Saqsaywaman sub-divided its historic drainage basins, re-

routed its hydrologic flow patterns and increased its average rainwater runoff 70%; all directly contributing to its current structural failures. Calculations also demonstrate that stop-gap remedies are inadequate and exacerbate the problems. Without appropriate remedial action, we conclude that further structural damage is expected at Saqsaywaman.

Acknowledgements: Kenneth Wright, Angelica Perez-de la Rosa, Alessandro Culotti, Erin Beckmann



Now Who Owns the Past?: Bolivian Autonomies, Antiquities Trafficking, and How Archaeologists Should Speak to the State Department

Donna Yates (University of Cambridge)

The 2009 Bolivian Constitution significantly changed the structure of the state and paved the way for the creation of regional, local and even Indigenous autonomies. These autonomies are charged with the management of archaeological sites and museums within their territory. This paper attempts to answer the question of who, legally, owns the Bolivian past and stems from concerns raised at the June 2011 renewal hearing of the Memorandum of Understanding (MOU, a bilateral agreement) preventing the import of illicit Bolivian antiquities into the United States. I will provide a short summary of the hearing and discuss some of the questions and concerns raised by the State Department's Cultural Property Advisory Committee (CPAC). I will then attempt to answer these questions based on recent Bolivian archaeological legislation.

As the Committee has not yet reached a decision about the renewal of the Bolivia MOU, I will present several possible outcomes and speculate about what each means for both Bolivian archaeology and the attempt to curb the flow of illicit antiquities into the United States. In closing, I will encourage archaeological professionals who work in South America to become actively involved in antiquities-related bilateral agreements and to participate in future CPAC hearings. We archaeologists have the information that is needed to protect the resources that our livelihood depends on, we just have to share that information properly.



Javier Pulgar Vidal's Models and Mapping of Land Use, Landscapes, and Environmental Diversity

Karl Zimmerer, Martha Bell (The Pennsylvania State University)

This paper examines the combined land use model and map of Peru, published by Javier Pulgar Vidal in multiple versions between 1940 and 1996. Pulgar Vidal's works have provided a series of pioneering advances in the models and mapping of multi-cultural (primarily indigenous) land use in the highly varied environments of the Andes and western South America more generally. One of Peru's most well-known twentieth-century land use planners, policy proponents, and

geographers, Pulgar Vidal has also been internationally influential and figures in a remarkable richness of archaeological and ethnohistorical studies as well as more general geo-visualizations of the Andes and Peru. Pulgar Vidal's geographic framework of Peru consists of national land use models and maps, originally published in a total of ten editions between 1946 and 1996, still widely used today. Our study embarks on a critical cultural- and human-ecological examination of the assumptions and implementations of the Pulgar Vidal framework. It focuses on the development and application of this geographic framework in Peru by placing emphasis on three land-use themes: (i) cultural-environmental diversity through indigenous concepts of elevation-based agri-environmental zonation, (ii) food production and adaptive capacity involving largely indigenous agrobiodiversity, and (iii) the geo-spatial organization of cultural-environmental information for agri-environmental resource management. We find the national scale and hybrid character of Pulgar Vidal's vision of multi-cultural land use to be the foundation for its widespread influence, as well as a source of its weaknesses (e.g. scalar mismatches, inter-scale translations) in many applications to case studies.



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