

ELLA GRANTS FOR 2012 ENGAGED LEARNING IN THE LIBERAL ARTS

Application for Funding



College of Humanities and Social Sciences, Utah Valley University

Deadlines: First round of applications is due at 4pm on December 6, 2011.

If funds remain after this deadline, a second round of applications will be due at 4pm on February 1, 2012.

ELLA grants support research, scholarly, and creative projects in the College of Humanities and Social Sciences that aim to increase and promote engaged learning. The college funds a wide variety of faculty projects each year. Though each application will formulate its specific articulation of engaged learning, in general successful projects will be directed by faculty members and will clearly involve students and student learning. Faculty who seek support for projects that are focused exclusively on faculty scholarship/research or faculty travel cannot be considered for this grant and should seek alternate funding sources (see a list of such sources on the last page of this application). Previously funded applications can be reviewed in the Dean's office.

Please submit completed applications in hardcopy or electronically to:

Jolene Arnoff
Dean's Office
College of Humanities and Social Sciences
LA 209
arnoffjo@uvu.edu
(801) 863-8743

| GENERAL INFORMATION | |
|---------------------|--|
| Name: | Haagen D. Klaus |
| Department: | Behavioral Science |
| Phone: | X6261 |
| E-Mail: | Haagen.klaus@uvu.edu |

| PROJECT | | | | |
|--|--|---------------------------------|----------|---|
| Date of Application: | 04 December 2011 | | | |
| Title of Project: | Student Presentation of the Lambayeque Valley Biohistory's Project's Research in Peru, 2009-11 | | | |
| Others Involved in the Project: | | | | |
| Name: | (1) Scott Applegate; (2) Connie Eriksen; (3) Elizabeth Byrnes | Student/ Faculty/ Staff: | Students | E-Mail: sjappelgate@gmail.com ; constertfirst@yahoo.com ; sapphirerayne@hotmail.com |
| Name: | (4) Marisa McKane; (5) Justin Hadley; (6) Ang DeMarco; (7) Becky Talpas | Student/ Faculty/ Staff: | Students | E-Mail: Marisa.mckane@gmail.com ; Hadley.justing@gmail.com ; angdemar@gmail.com |
| Name: | (8) Haagen Klaus | Student/ Faculty/ Staff: | Faulty | E-Mail: b.talpas@gmail.com ; Haagen.klaus@uvu.edu |

ABSTRACT FOR PROPOSAL

Not to exceed 500 words. On a separate sheet attached to this application, please include project time frame and specific objectives, and discuss how the project will contribute to the goals of engaged learning. The committee is looking for well-written abstracts that articulate clearly the goals and scope of the project.

PROJECT ASSESSMENT AND RELEVANCE TO ENGAGED LEARNING IN THE LIBERAL ARTS

- 1) ELLA funding not only encourages projects in engaged learning, but will provide you with opportunities to enhance your professional development as well. How will your proposal complement your teaching, service, and scholarship?**

The unique engaged learning opportunities that will emerge from attending these conferences will not only play a key role in the continued high-level student training we aspire to here at UVU, but will be of great benefit to me as a scholar. The teaching, service, and scholarship benefits are multi-fold and highly overlapping. The many presentations, posters, and symposia I attend contain information that I bring directly back to my UVU and incorporate into my curricula of every class I teach. For example, last year, I met up with Lee Berger who discovered the famous *Australopithecus seddiba* in 2009 and my time with Lee and examining his casts of *Au. seddiba* was plugged right back into my Physical Anthropology and Human Evolution lectures. The same goes for topics in forensic anthropology, paleopathology, bioarchaeology, and archaeology; there are simply too many instances to mention. Therefore, my attendance at these conferences keeps me current in my field to simultaneously and recursively inform my teaching and scholarship. Speaking of scholarship, the presentations with my student co-authors will represent a major contribution to Andean bioarchaeology, the archaeology of the Colonial Americas, and paleopathology that will be eventually converted into manuscripts for publication (see below). And overlapping scholarship are elements of service as I am co-chairing the Bioarchaeology of Contact and Colonialism symposium that for the first time brings together a group of international scholars (United States, Canada, S. Africa, Argentina, Peru, China, Mexico, and others) to address major lacunae in the global study of conquest in what amounts to the initiation of the second generation of bioarchaeological research into colonialism.

- 2) How do you intend to assess and measure the results of your grant? (At the conclusion of the grant year recipients will be asked to discuss informally the results of their projects with ELLA committee members.)**

In an immediate sense, we will receive feedback and constructive critique from hundreds of other international attendees ranging from students to the founders of our field. Also, all the posters at the Paleopathology Meeting (with the obvious exception of mine) have been entered into the Cockburn Prize Student Poster Competition, and our UVU students will be excellent competitors. This feedback and interaction will be critical to the next step – developing each presentation into a manuscript for submission to the American Journal of Physical Anthropology, the International Journal of Paleopathology, and the International Journal of Osteoarchaeology. Hadley and Klaus and Applegate and Klaus will likely go to AJPA, while the others are case studies better suited for IJPP and IJOA. The timeline has the students presenting me a manuscript draft on 01 Aug 2011. It is their summer academic project

They will also contribute data to the monograph I am beginning to write on the bioarchaeology of conquest in Lambayeque, Peru, and will also contribute to my co-edited volume on contact. In sum, successful presentation leading to dissemination and publication in top-ranked peer reviewed journals is the ultimate measure of the great impact ELLA support will have on these students. ELLA is the lynchpin that will make that happen. Also, the combination of two seasons of fieldwork in Peru, presentations at top international conferences, and a publication in a top-ranked peer reviewed journal will help pre-position our students to be highly competitive in their graduate school applications, which each one of them will be or is currently pursuing. ELLA support will also be fundamental in helping me attend the conferences and from which an edited volume will emerge from my symposium and my monograph on Contact in Lambayeque.

BUDGET INFORMATION

Please include on a separate sheet a detailed, itemized budget that breaks down the monetary request and explains clearly how the money will be used.

| | | | |
|---|------------|---------------|-------------|
| Amount Requested: | \$4,665.00 | | |
| Has previous ELLA funding been requested? | Yes | If yes, when? | Spring 2011 |

DEPARTMENT CHAIR ENDORSEMENT

An application will not be considered without a Department Chair's endorsement.

Comments:

I fully support this application for funding. The research that Haagen and his students are doing is top notch and is getting a lot of attention within the profession. It is a remarkable opportunity for undergraduate students to be doing what they are. Funding their travel to present their research provides students with a wonderful engaged-learning experience as they prepare their posters, present, and then refine their work in to journal articles.

Signature:



Date:

12/6/11

PLEASE CONSIDER THE FOLLOWING UVU SOURCES TO COMPLEMENT YOUR REQUEST FOR ELLA GRANT FUNDING

| | |
|---|--|
| Center for Engaged Learning | www.uvu.edu/cel |
| Scholarly and Creative Activities Council | http://www.uvu.edu/fsca |
| Institute for Professional Engagement | www.uvu.edu/ipe |
| Faculty Flexible Grant Program | www.uvu.edu/facultycenter |
| Supplemental Faculty Travel Grants | www.uvu.edu/facultycenter |
| Presidential Scholar Award | www.uvu.edu/urip/undergrad/ |
| Exceptional Merit Grant | www.uvu.edu/meritgrants/ |



04 December 2011

ABSTRACT OF ELLA FUNDING REQUEST
Haagen Klaus, Assistant Professor of Anthropology,
Behavioral Science Dept.

This proposal seeks to support seven UVU students and myself to attend the 81st Annual Meeting of the American Association of Physical Anthropologists (AAPA) and the 38th Annual Meeting of the Paleopathology Association (PPA) – *held concurrently* – in Portland, Oregon, from April 10-14, 2012. Between these two meetings, our students and I will present eight posters and one paper in a mini-symposium designed to showcase the results of the last three years of bioarchaeological and paleopathological findings of UVU's Lambayeque Valley Biohistory Project in Peru (titles and abstracts of these presentations are attached in a supplemental section). The proximal objectives are an integrated set of student presentations emerging from their research since 2009. In addition, I am co-chairing a symposium at the AAPAs on the bioarchaeology of conquest and colonialism. These activities will also serve as the basis of honing our students' scientific writing and presentation skills. Building on the conference experience, later objectives include conversion of their posters as manuscripts for publication.

ELLA support will be critical in helping our students take the next step in a carefully designed process of learning, teaching, and professional development. Since I began teaching and conducting research at UVU in 2008, I have involved our students in an engaged learning pedagogy inside and outside the classroom spanning Orem to Peru. As part of the full process of conceptualizing and conducting research, my students are expected to present their research at the top conferences in archaeology and physical anthropology as a prelude to publication. Additionally, past UVU student participation in academic conferences in 2010-11 embodied a very effective form of engaged learning unavailable anywhere else. Students find themselves at the center of cutting-edge knowledge in our field, constantly learning and thinking critically as they directly exchanging ideas and network with the leaders in physical anthropology and archaeology. In 2012, students will return home from Portland with new perspectives and constructive critiques and prepare each of their papers as a submission to a top-ranked peer reviewed journal such as the American Journal of Physical Anthropology and the International Journal of Paleopathology.

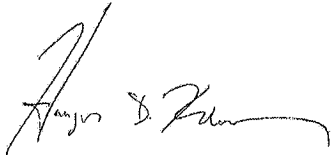
Timeline:

1. Poster text written: 01 February
2. Poster layout competed: 01 March
3. Poster printing: 15 March
4. Conference: 10-14 April
5. Manuscript Draft: 01 August
6. Submission of manuscript: 01 October
7. Publication: early-mid 2013

Ultimately, ELLA support will place our students at the forefront of current research and knowledge in ways the classroom cannot provide. They will interact and network with the best anthropologists in the world. It will garner the well-deserved recognition of UVU as a setting of outstanding engaged learning and undergraduate research. All of these students are grad school-bound; the engaged experiences and exposure they receive will be vital to their future success, competitiveness, and plant the seeds for their continued academic and professional development.

If there is anything that I may be of assistance, please do not hesitate to contact me. I am grateful for your consideration and your support of this student experience.

Sincerely,

A handwritten signature in black ink, appearing to read "Haagen Klaus". The signature is fluid and cursive, with a prominent initial "H" and a long, sweeping underline.

Haagen Klaus

PROPOSED BUDGET

Attending students will travel to the conference site via their own means. Once there, however, I do seek assistance to cover expenses for the student's hotel room at the designated student hotel; (three rooms; one for male students, two for female students). Food could be absorbed by students, but if a *per diem* rate is available to cover their expenses, that would be ideal. In addition, the Behavioral Science Department has offered to support each student with a \$100.00 contribution to defray conference costs. I will also be seeking funds from SCOP, the Faculty Center, and the Institute for Professional Engagement.

| | |
|---|-------------------|
| Airfare, Dr. Klaus, quote 4 Dec. from kayak.com: | \$320 |
| Poster printing at UVU (seven posters @ \$55/poster) | \$385 |
| Lodging (three rooms; one men's room, one women's room, and room for Dr. Klaus; 4 nights) | \$2,520 |
| State per diem rate for food (\$36/day/8 people/6 days) | \$1,440 |
| TOTAL ESTIMATED COST | \$4,665.00 |

Abstracts of Accepted Student Presentations, 2012

Anatomical and Biological Reconstruction of Mortuary Rituals: Case Studies from Colonial Eten, Lambayeque, Peru

Ang DeMarco¹, Scott Applegate¹, and Haagen D. Klaus^{1,2}

¹ Department of Behavioral Science, Utah Valley University

² Museo Nacional Sicán, Peru

A central challenge in bioarchaeology today involves greater integration of physical anthropologists in the field excavation of human remains. This is especially true considering the growing awareness of the field methodology of archaeoanthatology and its potential to contribute to reconstructions of burial patterns, paleopathology, and other biocultural dimensions of the past. In this poster, we examine two case studies of highly unusual mortuary treatments of ethnically Muchik children in the Early Colonial mission church established in the seaside settlement of Eten, north coast Peru. We hypothesize that seated and flexed children, one of which was buried inverted, represented some kind “deviant burial” during a period of unprecedented social tension and conflict.

Via the archaeoanthatological approach, strict anatomical *in situ* observation, documentation, and analysis of bone positioning and taphonomy reconstructs these potential bundle burials, and shows they are no different than any late pre-Hispanic burial of the same seated-flexed or even inverted positioning. Also, bioarchaeological data pertaining to population patterning of acute and chronic childhood stress, growth, and nutrition only reveal the rather unremarkable life histories and deaths of these children. Application of anatomical and skeletal biological information allows us to reject the hypothesis. Instead, these atypical interments probably reflect an early and rapidly terminated expression of religious syncretism during the Early Colonial encounter in Eten. In terms of methods, this work highlights the value of anatomical excavation and observation of human skeletal remains and the cross-disciplinary potentials of further integrating physical anthropology and field archaeology.

Ovarian Teratoma, Resorbing Ectopic Pregnancy, or Parasitic Twin? Description and Differential Diagnosis of an Exotic Bone and Tooth Mass in A Colonial Burial from Eten, Peru

Connie M. Ericksen¹ and Haagen D. Klaus^{2,3}

From 2010-11, the Lambayeque Valley Biohistory Project recovered 253 Early-Middle Colonial Period burials (~A.D. 1533-1620) at the ruins of the Capilla del Niño Serranito, Eten, Peru. Burial CNS U2-60 was adolescent female between 15-20 years old. During exposure, an anomalous ovoid mass was observed *in situ* within the left hemiabdominal space. The mass consisted of more than 75 bony and 37 dental elements. Bone elements were characterized by highly disorganized and asymmetrical organization including exotic mixtures of spicule formation, smooth lamellar surfaces, multiple foramina revealing clearly non-human, non-mammalian, and non-functional anatomy. Only one bone element was recognizable and appears to be a human stapes (ear ossicle). The dental elements are equally unusual, but some bear

human-like morphology and are reminiscent of deciduous incisors, canines, and molars. No occlusal or interproximal wear was present on the any of the dental elements.

We confidently rule out any kind of funerary or postdepositional offering, struma ovarii, or sacrococcygeal teratomas. Differential diagnostic options include dermoid cyst, ovarian teratoma, the remains of an ectopic pregnancy in the process of resorption, or a so-called parasitic twin (a fetus in fetu or a fetiform teratoma). Given the relative developmental maturity of the tooth crowns and roots, we tentatively reject dermoid and ovarian teratoma as well as fetus in fetu that is often characterized by higher degrees of bilateral symmetry and presence of a vertebral column. Resorbing ectopic pregnancy and fetiform teratoma remain as diagnostic options.

Grants to HDK from the National Science Foundation, the Wenner-Gren Foundation for Anthropological Research, and Utah Valley University generously funded this research.

Contrasting Conquest: Quantitative Paleopathological Analysis of Health Status Between Colonial Eten and Mórrope, Lambayeque Valley, Peru

Justin J. Hadley¹ and Haagen D. Klaus^{1,2}

¹ Department of Behavioral Science, Utah Valley University

² Museo Nacional Sicán, Peru

European contact and subsequent colonization of Americas has long been associated with notions of inevitable and universal demographic collapse and disease. However, the paleopathology and bioarchaeology of contact has convincingly rejected this uniformitarian perspective and replaced. Still, within-region analyses have remained somewhat of an exception, especially in South America. In this poster, we summarize results of the first quantitative study of paleopathological condition prevalence *within* a region of the Peruvian Central Andes. We test a simple hypothesis: the neighboring native Muchik populations of colonial Mórrope and Eten, living contemporaneously within the same coastal river valley, shared similar health burdens and heightened morbidity in the post-conquest world.

We collected data spanning acute and chronic childhood biological stress (enamel hypoplasias, porotic hyperostosis) non-specific skeletal infection, degenerative joint disease in principle load-bearing joint systems, and oral health. Data were analyzed by age cohort using odds ratios and G-tests in SAS 9.2. A significantly lower prevalence of porotic hyperostosis, non-specific infection, and DJD were present in Eten. Oral health data reveal Eten possessed a markedly lower prevalence of oral pathological conditions, especially antemortem tooth loss and periodontitis. We reject our hypothesis. Despite the common socioeconomic exploitation of local Muchik peoples in Colonial Lambayeque, we argue specific microenvironmental factors helped buffer against negative health outcomes and provided “raw material” for more successful indigenous adaptation to conquest in Eten. Methodologically, we highlight the need for any quantitative paleopathological analysis to be conducted relative to sample age structures rather than potentially misleading crude prevalence calculations.

Grants to HDK from the National Science Foundation, the Wenner-Gren Foundation for Anthropological Research, and Utah Valley University from 2005-2011 generously funded this research.

The Paleopathology of Childhood: Temporal Variation in Muchik Subadult Health in Colonial Eten, North Coast Peru

Marisa McKane¹ and Haagen D. Klaus^{1,2}

¹Department of Behavioral Science, Utah Valley University

²Museo Nacional Sicán, Peru

Owing to their unfolding and dynamic ontogeny, a child is perhaps most sensitive to a population's experience of stress. Here, we examine impacts of European conquest in the colonial *reducción* of Eten, north coast Peru. How did biological stress affect postcontact children? Did it change over time? Using odds ratios and G tests, we compared temporal variation in prevalence of childhood stress markers (enamel hypoplasias, porotic hyperostosis, scurvy, infection, trauma, oral health, artificial cranial deformation) from 253 skeletons from the cemetery of the Capilla del Niño Serranito de Eten (CNS) (Early/Middle Colonial Period, ~A.D. 1533-1620) and 242 skeletons from the Capilla de Santa Maria de Magdalena de Eten (CSMME) (Middle/Late Colonial Period, ~A.D. 1620-1750).

Results show statistically equivalent patterns of enamel hypoplasias at 44% and 48% at the CNS and CSMME, respectively. Anemia appears to increase with prevalence rising from 19% (CNS) to 35% (CSMME), but is not statistically significant. Childhood infection is virtually absent in both cemeteries. Both groups of children share equivalent prevalence of oral pathological conditions. Children at the CSMME show a statistically significant increase in skeletal trauma. Scurvy, present at the CNS, disappears completely in the later CSMME series. Artificial cranial deformation, common at the CNS, appears to be completely abandoned by the Middle/Late Colonial sequence. This work helps characterize the complexity of indigenous postconquest experiences, and in particular, lack of variation in hypoplasias and anemia may be linked most strongly to common local ecology instead of the major socioeconomic changes that characterized later Colonial Peru.

Grants to HDK from the National Science Foundation, the Wenner-Gren Foundation for Anthropological Research, and Utah Valley University from 2009-2011 generously funded this research.

**A Probable Case of Venereal Syphilis From The Chapel of San Pedro de Mórrope:
Atypical Lesion Patterning and Burial Treatment from Peru's Early Colonial Period**

Becky-Ann Talpas¹ and Haagen D. Klaus^{1,2}

1. Department of Behavioral Science, Utah Valley University
2. Museo Nacional Sicán, Peru

Syphilis has long been a focus of paleopathology -- highlighting the importance of this infection in studies of the biocultural history of disease and differential diagnosis of bony lesions. In the 2005 excavations of the Lambayeque Valley Biohistory Project in Mórrope, Peru, one individual (CSPM U4 05-32), stood out for a notable constellation of skeletal lesions. This adult woman (aged 45+) probably died in the mid-16th century not long after European conquest. She was found in a position suggestive of being thrown in or dumped into the burial pit, and the superior half of the skeleton was fragmentary. Despite poor preservation, cranial vault fragments possessed multiple stellate scars. Active inflammation was observed bilaterally in the scapulae, clavicles, distal humerii, left superior femur, and the entire diaphysis of the right femur was affected by massive proliferation of gummatous lesions. Medullary spaces were obliterated in the left clavicle and right femur. Tibiae and fibulae were not affected by active lesions.

Differential diagnoses are considered including hematogenous osteomyelitis, osteitis, tuberculosis, yaws, and venereal syphilis. Despite the patent lack of classic tibial inflammation or sabre-shin deformity, latter emerges as the most likely diagnostic option; medullary obliteration of the clavicle is virtually pathognomonic for venereal syphilis. This is the only case of treponemal infection currently documented in more than 1,500 skeletons from the pre-Hispanic and Colonial-era Lambayeque Valley Complex. We also consider links between paleopathology and mortuary archaeology regarding how the living disposed of an individual afflicted by syphilis at the time of death.

Grants to HDK from the Wenner-Gren Foundation for Anthropological Research, The Ohio State University, and Utah Valley University generously funded this research.

**Patterns of Skeletal Trauma in Eten:
New Windows on Lifestyle and Violence in Colonial Peru**

Scott Jay Applegate¹ and Haagen D. Klaus^{1,2}

¹Department of Behavioral Science, Utah Valley University

²Museo Nacional Sicán, Peru

Paleopathological analysis of traumatic skeletal injury can provide key perspectives on lifestyle and behavior. During the Colonial era of Peru, Spanish economic policy utilized local populations for labor, and the Spanish were also associated with brutal treatment of colonized peoples. With our recent excavations of 492 skeletons from Colonial Eten in Peru's Lambayeque Valley, we test the hypothesis that prevalence of skeletal trauma increased from pre-Hispanic times and included frequent examples of interpersonal violence.

Of the 451 skeletons complete enough to score for trauma, 31 (or 6.8%) were affected by ante- or perimortem injuries. Almost all broken bones (primarily clavicles, ribs, and long bones) can be characterized as accidental in origin. Rib fractures were most common. Poor fracture reduction in several cases (including femoral neck fractures) indicates continued mobility on incompletely healed injuries. The only evidence of interpersonal violence was documented in two children – one with perimortem blunt force cranial trauma, and another exhibiting multiple perimortem sharp force defects on the frontal bone consistent with use of a metal sword. We reject the hypothesis. Odds ratios demonstrate trauma prevalence is not statistically significantly different than pre-Hispanic population. The Spanish evidently did not commonly employ violence extreme enough to break bone as a means of labor organization or social control in Eten. However, the distinct qualitative differences of trauma in Eten may be related to native people working to meet their labor tribute taxes in a hazardous local ecology featuring steep cliffs, heavy surf, and a rocky coastline.

Grants to HDK from the National Science Foundation, the Wenner-Gren Foundation for Anthropological Research, and Utah Valley University from 2009-2011 generously funded this research.

Cranial Lesions and Maxillofacial Skeleton Asymmetry in A Late Historic Burial from Eten, Peru

Elizabeth E. Byrnes¹ and Haagen D. Klaus^{1,2}

¹ Department of Behavioral Science, Utah Valley University

² Museo Nacional Sicán, Peru

During the 2010 field season of the Lambayeque Valley Biohistory Project in Eten, Peru, we documented Burial CNS U3-5B. This was an intrusive Late Historic single inhumation (probable 19th C.). Placed within a simple plank coffin, the skeleton of this edentulous, elderly adult male was in an excellent state of preservation. This individual's cranium possessed multiple pathological defects. An irregular, smooth-walled, and penetrating lesion dominated the superior right eye orbit resulting in destruction some 90% of the orbital roof. A similar but smaller penetrating lytic focus was present on the frontal bone superior to the left eye and was characterized by smooth and externally beveled edges. In both, no evidence of inflammation was observed, though disorganized patches of bone-like tissue were present. A third deeply depressed lesion was present between the left nasal bone and medial border of left orbit. Within both orbits, multiple loci of bone loss were observed bilaterally on the orbital surface of the sphenoid and lacrimal bones. The interorbital region is angled (warped) to the left, and the right eye orbit is asymmetrically enlarged.

We argue that there are likely multiple pathological processes represented in this cranium. After ruling out pseudopathology and metastatic processes, the first set of lesions may be most consistent with dermoid cysts, and most specifically, epidermal inclusion cysts. The intraorbital foci may represent lesions associated with osteolytic metastatic carcinoma or multiple myeloma. Maxillofacial asymmetry may have resulted from a combination of traumatic injury earlier in life and cystic expansion.

Scurvy in Andean South America: A Review of the Evidence from the Lambayeque Valley, Peru

Haagen D. Klaus^{1,2}

¹ Department of Behavioral Science, Utah Valley University

² Museo Nacional Sicán, Peru

Scurvy is a metabolic disorder serves as a key measure of nutritional inadequacy (insufficient intake of vitamin C) in past populations. Following Ortner et al. (1999) who were the first to establish the evidence of scurvy in subadult crania from the central coast and highlands of Peru, this work seeks to answer a basic question: was vitamin C deficiency also present in the Lambayeque Valley on the northern north coast of Peru?

Since 2001, nearly 400 archaeologically excavated subadult skeletons have been examined from 17 Lambayeque valley sites (Middle Sicán to Late Colonial eras; ~A.D. 900-1750). Lesions considered pathognomonic for subadult scurvy (abnormal cortical pathology of the greater wing of the sphenoid) were observed in conjunction with other locations associated with abnormal scorbutic vascularity including the cranial vault, superior eye orbits, posterior maxilla, zygomatic bone, alveolar bone, and subperiosteal hemorrhage on long bone diaphyses – while ruling out differential diagnoses such as cribra orbitalia, porotic hyperostosis, localized trauma, and infection. The current evidence show scurvy was present in Lambayeque, but appears exceedingly rare in the late pre-Hispanic era (N=2). During the Colonial period, definitive scurvy was observed in at least six subadults, particularly in the seaside site of Eten. This work establishes the presence of scurvy on the far north coast of Peru and leads to the working hypothesis that vitamin C deficiency may have increased in prevalence over time, associated with the broader documented decline of native health following European conquest.

Grants from the National Science Foundation, the Wenner-Gren Foundation for Anthropological Research, and Utah Valley University from 2005-2011 generously funded this research.

Surfacing from the Wake of Conquest: Regional Diversity in Biocultural Responses to European Colonization, Northern Peru

Haagen Klaus^{1,2} and Rosabella Alvarez-Calderón^{2,3}

¹ Department of Behavioral Science, Utah Valley University

² Museo Nacional Sicán, Peru

² Harvard University Graduate School of Design

The transition to the colonial world in the Americas was once thought as a monolithic process of native demographic collapse and population extinction. However, bioarchaeological research in North and Central America has revealed a diverse range of outcomes to conquest among the native survivors and generations of their descendants. Following the first phase of our long-term investigation into the postcontact adaptive transition in Mórrope, the focus of the Lambayeque Valley Biohistory Project shifted to Eten, and included excavation of two colonial church ruins

over three field seasons (2009-2011) producing a sample of 475 Early/Middle and Middle/Late Colonial burials. When compared to the contemporaneous neighboring population of Mórrope, paleopathological data appears to reveal complex and contrasting native experiences within colonial Lambayeque.

Initial analysis indicates the Muchik people of Eten were in some ways healthier than the people of Mórrope: they appear to have endured and survived greater degrees of acute subadult stress (measured by linear enamel hypoplasias) and experienced less childhood anemia and chronic adult infection. Much of this may owe to the unique and diverse biotically-rich microenvironments of Eten. Oral health data suggests the Eten population consumed a diet low in carbohydrates and high in marine resources. Paradoxically, four mass graves in Eten point to high mortality events that were not observed in Mórrope. Eten also includes qualitatively more severe degenerative joint lesions, more activity-related injuries (broken ribs and femoral neck fractures), and examples of deadly interpersonal violence experienced by children. In sum, this paper provides a first glimpse of a significant and previously unknown range of colonial experience in the Lambayeque Valley faced by the first generation of the survivors of conquest and their descendants.

Abstracts of Accepted Symposium, 2012

Bioarchaeology of contact and colonialism

Organized by Melissa S. Murphy (University of Wyoming) and Haagen Klaus (Utah Valley University)

This symposium is organized around the topic of bioarchaeology of contact and colonialism and proposes to convene participants to discuss and compare current issues in bioarchaeological research of colonial encounters and contact after the 16th Century from different areas of the world. Colonial encounters and cultural contact had profound transformative effects that can be discerned from the material record. Bioarchaeological studies of colonialism often focus on the experiences of the colonized or native peoples or the dichotomous relationship between the colonizer and the colonized, but considerable study has shown that native experiences were considerably varied and that the effects of colonialism were not only felt by indigenous groups, but also by the colonizers themselves and that these effects may have altered the relationships between indigenous groups. Some possible topics discuss the biocultural impact of health on indigenous peoples, violence and warfare, paleodemography and the formation of hybrid and different identities (native, colonizer, mestizo, etc.) from a bioarchaeological perspective, the nature of 'indigeneity' and the process of ethnogenesis, paleodemography and population dynamics, as well as the nuances of meaning in shifting mortuary patterns after colonialism. Rather than focusing on one hemisphere or one region, we have invited participants that work in many different areas of the world and the symposium has considerable global representation.

Papers:

Haagen D. Klaus (Utah Valley University) and Rosabella Alvarez-Calderón
(Harvard University Graduate School of Design)

Surfacing from the Wake of Conquest: Regional Diversity in Biocultural Responses to European Colonization, Northern Peru

Catherine M. Gaither (Metropolitan State College of Denver), Melissa S. Murphy
(University of Wyoming), Jeffrey Quilter (Harvard University), Carrie Brezine (University of Michigan) and Regulo Franco

Population health in the early colonial reducción of Magdalena de Cao Viejo

Ricardo Guichon (U. Nacional del Centro de la Provincia Buenos Aires, Buenos Aires, Argentina)

Bioarchaeology of interethnic contact in Tierra del Fuego XIX-XX century

Mark Nathan Cohen (University of Plattsburgh), Marie Danforth (University of Southern Mississippi), Nancy Elwess (University of Plattsburgh)

New Research on the Colonial Period Maya Cemetery at Tipu, Belize

Andrea Cucina and Vera Tiesler (Universidad Autónoma de Yucatán, Mérida, Mexico)

Physiological stress in a multi-ethnic cemetery population from colonial Campeche, Mexico

Vera Tiesler and Pilar Zabala, (Universidad Autónoma de Yucatán, Mérida, Mexico)

Survival and abandonment of indigenous head shaping practices in the New World During the colonial period

Kristrina Shuler (Auburn University), Hannes Schroeder (University of Copenhagen), William Stevens (University of South Carolina)

Sugar, Health, and Slavery: Forty Years of Bioarchaeological Research at Newton Plantation, Barbados

Emily S. Renschler (Bowdoin College), Christopher R. DeCorse (Syracuse University)

The Bioarchaeology of Elmina, Coastal Ghana

Isabelle Ribot (University of Montreal) and Alan Morris (University of Cape Town, South African)

The legacy of slavery and trade: morphometric assessment of 18th Century populations dynamics at the Cape of Good Hope

Lauren A. Winkler, Clark Spencer Larsen, Victor D. Thompson, and Paul W. Sciulli, (Ohio State University)

The Structuring of Health in Colonial Spanish Florida: Linking Stress, Status, and Inequality in the Georgia Bight

Danielle N Cook (University of Alabama), J Lynn Funkhouser (University of Southern Mississippi), Marie Elaine Danforth (University of Southern Mississippi), and Barbara T

Hester (University of Southern Mississippi)

La Fin du Voyage: The French Colonial Experience in the Americas

Christine Lee (Institute of Vertebrate Paleontology and Paleoanthropology) and Linhu Zhang (Renmin University)

Are bound feet an expression of Chinese ethnic identity during the Manchurian Qing Dynasty (1644-1911)?

Melissa S. Murphy (University of Wyoming)

The interpretation of shifting mortuary patterns after contact and colonialism

Clark Spencer Larsen (Ohio State University)

Discussant