SAS Bulletin

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Día de los Muertos

This issue of the *SAS Bulletin* goes to press on November 1, an auspicious day for many people throughout the Americas.

Nearly half a millennium has passed since the Spanish conquistadors arrived to what is now Mexico and witnessed native peoples practicing rituals in honor of their ancestors. Today these rituals continue, some in a highly transformed state, and are practiced all over Mexico, Central America, and parts of the United States. The day is known to some as "Día de los Muertos" or "Day of the Dead."

In prehispanic times, the celebration lasted throughout the month of August (roughly the ninth month of the Aztec calendar), and was presided over by the goddess Mictecacihuatl, the so-called "Queen of the Underworld," whose purpose is to keep watch over the bones of the dead. Today, the celebration coincides with "All Saint's Day."

For the event, people wear wooden skull masks and dance in honor of their ancestors. Some celebrate by visiting deceased relatives at the cemetery. And in some instances, sugar skulls, made with the names of the dead person on the forehead, are eaten by a relative or friend. The display of human remains (real or mock) is central to most practices.

Sugary confections in the shape of human skulls are a popular snack on "Day of the Dead."

As Gordon Rakita notes in his review of the past decade of bioarchaeology in this issue of the *SAS Bulletin*, archaeological scientists have made great strides in understanding rituals like "Day of the Dead," as well as the health and livelihoods of the ancestors who take center stage in these practices.

In addition to Rakita's contribution, this issue of the *Bulletin* features three research articles on bioarchaeological analysis: "Fractured Childhood: A Case of Probable Child Abuse From Ancient Egypt" by Sandra Wheeler and colleagues, "Metric Sex Estimation in an Ancient Egyptian Skeletal Sample" by Michelle Raxter, and "Stable Isotopic Relationships between Age, Sex, and Maize Consumption in the Mississippian Vincennes Phase of Indiana" by Joshua Wells and Carlina de la Cova. In celebration of "Day of the Dead," we offer these articles in cutting-edge bioarchaeological research so that we all can appreciate how new discoveries in the analysis of human skeletal remains help us understand the world around us.

E. Christian Wells, Editor

In This Issue

Employment Opportunities

Chicago's Field Museum announces an opening for a tenure-track position as Assistant Curator of Anthropology for fall 2008. The museum seeks a top scholar whose research addresses themes relevant to a broad public and speaks to the discipline at large. The successful candidate will have an active field research program documented by grants and publications and will be firmly grounded in collections based research. Applicants should have a focus on material culture and a willingness to collaborate with local scholars and communities from the areas in which they study. Geographical, technical, and sub-disciplinary areas of expertise are open, but should complement existing department strengths. The museum has collections and research interests in North America, the circum-Mediterranean, and any part of Asia that are currently underrepresented on our curatorial faculty. The Field Museum is one of the world's top natural history research museums, with over 150 scientists on staff and a curatorial faculty of nearly 40. The Department of Anthropology, with 10 curators, is one of the most active departments in the nation in terms of research, exhibitions, active field collection, and education. The museum has significant laboratory facilities in molecular genetics, compositional chemistry, and scanning electron microscopy. For more information, please see our website http://www.fieldmuseum.org/research_collections/anthropology/default.htm. Interested scholars should send a letter of interest, statement of research and collection-oriented objectives, and cv including names and contact information of three references to: Curatorial Search Committee Chair, Department of Anthropology, Field Museum of Natural History, 1400 S. Lake Shore Dr., Chicago, IL 60605. For fullest consideration, submissions must be received by November 30, 2007.

East Carolina University seeks an archaeologist with an interest in the late prehistoric period in the Southeastern United States for a tenure-track full-time assistant professor position, starting August 18, 2008. The successful candidate will teach general anthropology, introduction to archaeology, and graduate level courses in area of specialty. Preference will be given to candidates who are familiar with CRM and remote sensing. Applicants should demonstrate the potential for research, publication and extramural funding. Appropriate professional service is expected. PhD required. ABD's considered at rank of instructor. The department has 12 anthropologists and offers the BA and MA degrees. To apply, complete a candidate profile and submit a letter of interest, curriculum vitae, and list of three current references online at www.jobs.ecu.edu. Screening begins January 10, 2008 and will continue until position is filled.

Southern Illinois University Carbondale, Center for Archaeological Investigations, seeks its 2008-2009 Visiting Scholar (VS). The VS organizes and conducts an archaeological conference at SIUC, resulting in an edited volume of selected papers. VS assembles and edits conference volume while in residence. The successful candidate is also expected to pursue his/her research and teach one seminar in his/her specialty. 11-month term appointment as a Visiting Scholar. Qualifications: Ph.D. in Anthropology or related discipline with specialization in archaeology. Degree must be completed by August 16, 2008. VS selected on the basis of a 5-page proposal outlining the nature and structure of the conference and on the strength of vita and references. Pre-application inquiries recommended. Closing date: February 1, 2008. Send letter, vitae, list of references, and proposal to: Dr. Heather Lapham, CAI, Faner 3479 - Mail Code 4527, Southern Illinois University Carbondale, 1000 Faner Drive, Carbondale, IL 62901; Tel: (618) 453-5031; E-mail: hlapham@siu.edu.

The University of Arizona, Arizona State Museum, invites applications for Assistant Curator of Bioarchaeology with tenure-equivalent status beginning July 1, 2008. The position oversees human osteological collections, works with the repatriation coordinator, serves as a liaison on human remains issues, designs standards for the excavation, documentation and care of burials, and performs research. Teaching and working with students is desired. Demonstrated ability in bioarchaeological research in the Southwest preferred. Ph.D. required. Submit a letter of application stating research and collections experience along with curriculum vitae and complete contact information for three references at www.uacareertrack.com.

Statistical Research, Inc. (SRI; http://www.sricrm.com), is seeking a geoarchaeologist with experience in conducting geoarchaeological and geomorphological investigations associated with archaeological projects. The position will be based in SRI's Redlands, California, office. This position requires an advanced degree in geosciences or anthropology (with a focus on geoarchaeology) and at least two years of fieldwork and analytical experience. Applicants should be especially strong in alluvial and coastal geomorphology. The successful applicant is expected to be able to multitask, typically working on two to three projects simultaneously, while at the same time meeting major project deadlines and remaining within project budgets. Duties include, but are not limited to, conducting background research and fieldwork for geoarchaeological assessments, archaeological surveys, testing and data recovery projects, and preparing technical reports. This position requires excellent writing and organizational skills. Applicants are expected to be professionally active members of the discipline and should have a general familiarity with the archaeological literature and prehistory of California. Experience with programs such as Word Perfect, Word, and Excel is required, and GIS experience is helpful. An important key to this position is the ability to work both independently and as part of a team on small to large archaeological projects. The successful applicant must be a Registered Professional Archaeologist or be eligible for RPA registration. Submit applications or questions regarding the job on-line at srijobs@sricrm.com. For applications, please reference the geoarchaeologist job listing and include a cover letter, a resume detailing relevant experience, the names of three references (with contact information), and examples of at least two completed geoarchaeological reports. Applications will be accepted until the position is filled.

Awards, Fellowships, and Training

Douglas C. Kellogg Fund for Geoarchaeological Research provides support for thesis or dissertation research, with emphasis on the field and/or laboratory aspects of this research, for graduate students in the earth sciences and archaeology. Recipients of the Kellogg Award will be students who have (1) an interest in achieving the M.S., M.A. or Ph.D. degree in earth sciences or archaeology; (2) an interest in applying earth science methods to archaeological research and (3) an interest in a career in Geoarchaeology. Under the auspices of the SAA's Geoarchaeology Interest Group, family, friends, and close associates of Douglass C. Kellog formed a memorial in his honor. The interest from money donated to the Douglas C. Kellog fund is used for the annual award. Initially the amount to be awarded on an annual basis was $500. The amount of the award given to the recipient will increase as the fund grows and the amount of the annual interest increases. The 2008 Award will be presented at the 73rd Annual Meeting of the SAA. Deadline for submission: December 1, 2007. Contact: Dr. Christopher L. Hill, Department of Anthropology, Boise State University, 1910 University Drive, Boise, Idaho, 83725-1950; email: chill2@boisestate.edu.

MSc or PhD Research Opportunity in Paleoecology at University of Victoria, Canada for students interested in pursuing research at the MSc or PhD level to start in the summer or fall of 2008 in the Department of Geography at the University of Victoria (UVic) http://www.geog.uvic.ca. The main approach of my lab is to examine ecological dynamics and interactions between the biosphere, geosphere and atmosphere using the geological record and Quaternary science methods (such as pollen analysis) that provide a long-term perspective on vegetation dynamics. Faculty research focuses on vegetation dynamics since the last glaciation, the climatic and non-climatic factors that drive these dynamics, and the responses of plant communities to past climatic change. The main geographical focus of the lab is the Pacific coast of Canada, a region characterized today by temperate rain forest. Although my own interests focus on vegetation dynamics, students will be free to develop their own research projects including topics in paleoclimate reconstruction and human-environment interactions. Prior experience in this area of research is an asset, but is not necessary. Applicants should be highly-motivated, with a strong background in physical geography, geology or ecology. Funding for these graduate positions is flexible with regard to the research topic. Guaranteed funding is available through a combination of fellowships, research assistantships and teaching assistantships. Students interested in any aspect of paleoecology are encouraged to email tlacours@uvic.ca to discuss their background and research interests.

MSc Opportunity at the University of Northern British, Columbia in 'Quaternary Soils Research in Northwestern Canada.' An opening is available for September 2008 in the Natural Resources & Environmental Studies MSc program at the University of Northern British Columbia. Applications are invited from undergraduates majoring in earth sciences, geology, soil science, physical geography or related disciplines. Strong field skills are essential. Potential research projects include: the role of Holocene natural disturbances in soil formation on loess-mantled slopes (SW Yukon), genesis of soils on the unglaciated Klondike Plateau and on Quaternary glacial deposits in central Yukon, and aeolian contributions to soil genesis in NW Canada. This multi-disciplinary research involves collaborators at UNBC, other universities, and several Yukon and federal agencies. For additional information, please contact Dr. Paul Sanborn (sanborn@unbc.ca) or visit http://web.unbc.ca/~sanborn/index.html. Early inquiries are strongly recommended. Application information is found at http://www.unbc.ca/graduatestudies. UNBC awards research and teaching assistantships, and entrance scholarships, on a competitive basis to qualified graduate students. Please note that the deadline for September admissions is February 15, 2008.

PhD Studentship in the School of Geography, Geology, and Environmental Science at The University of Auckland, New Zealand on 'High resolution Multi-proxy Paleoclimate Analysis of New Zealand Maar Lake Sediment Records Spanning the Last Two Millenia.' Funding is available for a PhD studentship tied to a funded research program at the University of Auckland. The PhD project will form a part of a multi-proxy study of high resolution paleoclimate records from northern New Zealand contained in the maar crater lakes from Auckland, Kauri (Agathis australis) tree-ring records and speleothems. In each case the approach is to assemble a reliable data set and then use transfer functions to translate the results into meaningful climatic parameters. The PhD project will focus on high-resolution multi-proxy examination of maar lake sediment sequences from Auckland, New Zealand that span the last 2000 years. The records can be analysed using a range of geochemical and/or paleoecological approaches so that it may be possible to tailor the project to the interests and background of the successful applicant. The maar lake analyses could include chronology refinement and a range of biological and geochemical proxies of change. These high resolution records will then be compared with Kauri (Agathis australis) tree ring-based paleoENSO records spanning much of this time period that have annual resolution. Qualifications: Applicants must have or expect to obtain a strong first or upper second class degree in geology, geography, environmental science or a related natural science subject. A recognised Masters degree in a relevant subject would be an advantage, as would previous training in a relevant area of the Quaternary sciences such as paleolimnology, sediment geochemistry or paleoecology. The living stipend is NZ$25,000 tax-free and applicable tuition fees will be paid from the grant. Applicants for the PhD scholarship should send a copy of their curriculum vitae, including the names and contact details of at least 2 referees to: Paul Augustinus (p.augustinus@auckland.ac.nz), School of Geography, Geology and Environmental Science, The University of Auckland, Auckland, New Zealand. Further information regarding postgraduate study can be found at the website: http://www.postgrad.auckland.ac.nz/uoa/for/postgradstudents.

Conference News and Announcements

The **33rd International Geological Congress** will take place 6-14 August 2008, in Oslo, Norway. Abstract submission and early registration are now available online. The deadline for the GeoHost Program is fast approaching. An updated Science Programme has just been posted. The congress provides an opportunity for all fields of geosciences: hazards, climate change, sedimentology, geomorphology, etc. For further details please check the website: www.33igc.org

The **38th Annual International Arctic Workshop Institute of Arctic and Alpine Research** will be held at the University of Colorado, March 5-7, 2008 in Boulder, Colorado USA. For more information, visit the website: http://instaar.colorado.edu/AW or contact: ArcticWS@colorado.edu. Deadline for Registration and Abstracts: Wednesday, 13 February, 2008. Presentations can be either a poster or a talk. The meeting is open to all interested in the Arctic, and will consist of a series of talks and poster sessions covering all aspects of high-latitude environments, past and present. Previous Arctic Workshops have included presentations on arctic and Antarctic climate, archaeology, environmental geochemistry, geomorphology, hydrology, glaciology, soils, ecology, oceanography, Quaternary history, and more. Student participation is a vital component of this workshop. A limited number of students giving a talk or poster will receive financial assistance, including registration and hotel support.

An End to History? Climate Change, the Past and the Future, April 3-4, 2008, Birmingham and Midland Institute, Birmingham. The premise of this conference is that human society has had a potentially catastrophic effect on the earth's climate. For some commentators it is not out of the question that we will bring about our own extinction unless we modify our behaviour. And while the scientific community has had a major influence on governments' and the public's understanding of climate change, the contribution of the humanities has been less significant. With that in view, this conference seeks contributions from across the humanities, from historians, archaeologists, anthropologists, sociologists, psychologists, human geographers, demographers, philosophers, writers, and from students of politics, economics, international relations, religion, literature and culture. Contributions should aim to explore how this potentially catastrophic situation has arisen; understand how societies, polities and cultures have previously or currently sustain themselves in conditions of scarcity and adversity; learn from the experiences of past and current societies, which have coped with severe climate or environmental change; or, raise awareness of the value of humanities for understanding climate change and its impact on past and present societies. The conference is open to everyone with an interest in the development of our understanding of climate change. Please submit brief abstracts (200 word max) by November 30, 2007.There will be a conference fee of £15 per day for waged delegates. For students and the unwaged there will be a fee of £10 per day. For more information, contact: EndofHistoryConference@googlemail.com.

The **37th Annual International Symposium on Archaeometry** will be held in Siena, Italy, May 12-16, 2008. Key Dates: deadline for submission of abstracts is December 15th, 2007; notification of acceptance or rejection is January 30th, 2008; deadline for registration and payment of regular registration fee is March 1st, 2008; deadline for hotel reservations is March 1st, 2008. For more information, visit the website, http://www.unisi.it/eventi/isa2008/index.htm.

DNA, Shipwrecks and Harbours, and Environmental History

New Virtual Special Issues
from the Journal of Archaeological Science

Elsevier has released a series of virtual issues from the *Journal of Archaeological Science* that bring together articles spanning 1979 and the present. The featured subject areas are: **DNA, Shipwrecks and Harbours**, and **Environmental History**. They can be accessed freely via the journal homepage, www.elsevier.com/locate/jas and abstracts for each of the articles are available for free on ScienceDirect. You can sign up for free e-alerts to tell you when new issues and virtual issues of the journal are online. Visit the *Journal of Archaeological Science* homepage to access the virtual special issues, sign up for alerts, claim your discounted subscription rate, or submit an article.

2007 Rip Rapp Archaeological Geology Award to Norman Herz

Citation by Scott Pike and Ervan Garrison

The 2007 Rip Rapp Archaeological Geology Award was recently presented to Norman Herz of the University of Georgia. Below is an excerpt from the citation delivered by Scott Pike and Ervan Garrison (selected and adpated from the full text available at http://www.geosociety.org/awards/07speeches/riprapp.htm) at the annual meeting of the Geological Society of America.

"It would be wrong to say that this year's recipient of the Rip Rapp Award in Archaeological Geology has always wanted to be an archaeological geologist. Don't take this wrong, but who had? Even by the time he entered graduate school, no one had had the debate yet on whether "archaeology" should qualify "geology" or "geology" should qualify "archaeology." The two disciplines were worlds apart. Even in his first foray into the interdisciplinary world of archaeological geology in the 1950s, our awardee had no idea that his work with the renowned late archaeologist W.K. Pritchett was going to be a major watershed event towards the integration of the natural sciences into classical archaeology. This is not to say our awardee did not have vision or direction. He certainly did. Just as it took Odysseus twenty years to return to his home, it took our wayward traveler nearly two decades to return to academia, leaving the world of hard rock geology at the USGS to take on the Chair of the Department of Geology at University of Georgia."

"It was at Georgia that our friend, mentor and today's honoree, Norman Herz, established himself as a preeminent visionary in the nascent field of archaeological geology. Looking to discriminate between the many sources of ancient white marble in the Mediterranean, Norm worked to find an analytical technique that was at one end objective and at another end required very little sample. Norm found that technique by delving into the measurement of carbon and oxygen stable isotopes. From the late 1970s through the 1980s, Norm went on "arduous" expeditions to collect multiple samples from the important ancient marble quarries in Turkey, Greece and Italy. Working alongside archaeologists and art historians, Norm was able to show that many quarries had unique stable isotope signatures. Norm was able to assign provenance to many marble artifacts and address important questions regarding the use, trade and quarrying of this important ancient resource. Norm has consulted on numerous projects including studying the marble sources of various temples and monuments at sites such as ancient Olympia, Bassai, the Athenian Agora, and Delos. He has worked closely on collections from the British Museum in London, the Ny Carlsberg Glyptotek in Copenhagen, The National Gallery in Washington DC and the Metropolitan Museum of Art in New York. Norm's work has been published in over 200 articles..."

"[I]n 1988 Norm spearheaded the organization of the Association for the Study of Marbles and Other Stones used in Antiquity (ASMOSIA). Along with his colleague Marc Waelkens, Norm convened a NATO-sponsored Advanced Research Workshop (ARW) in Tuscany, Italy. This was the first ARW devoted to the Archaeological Sciences in the International Scientific Programmes of NATO. At this first meeting, Norm was elected President. There have now been eight international ASMOSIA conferences bringing together a truly interdisciplinary group of scholars including geochemists, geologists, chemists, physicists, statisticians, archaeologists, museum curators, art historians and others who share research interests and perspectives on ancient stone... Since that first meeting of 53 participants, ASMOSIA's membership has grown to over 300 from over 23 countries. The continued success of the biennial ASMOSIA conferences is an excellent testament to Norm's vision and leadership in fostering interdisciplinary research... Norm was re-elected President several times and in 2000 he was elected Honorary President."

"In 1985, the American Journal of Archaeology celebrated its one hundredth anniversary. In a review of the stewardship of Ashton Sanborn as editor, only two articles were cited as "significant events". One was the aforementioned paper by Herz and Pritchett in 1953 which "raised issues that have continued to be of interest to scholars in many specialties, and only recently have sophisticated laboratory techniques begun to answer some of the vexed questions of marble identification." Four years later, in the January-February special issue of Archaeology dedicated to "Archaeology in the 21st Century," George F. Bass, then president of Archaeological Institute of America, further recognized that Norm was the "first to apply his geologic knowledge to archaeological problems." Norm's international reputation was further enhanced where, in 1988, he was invited to be the keynote speaker at the 18th International Symposium of the International Association of Engineering Geology where the focus of the conference was on the engineering geology of ancient works, monuments and historical sites. In 1995 the classical archaeology community recognized Norm's contributions to archaeology by awarding him the prestigious Pomerance Award for Scientific Contributions to Archaeology of the Archaeological Institute of America."

Fractured Childhood: A Case of Probable Child Abuse from Ancient Egypt

Sandra M. Wheeler[1], Lana Williams[1], Patrick Beauchesne[2], and JE Molto[1]
[1]Department of Anthropology, University of Western Ontario, Canada
[2]Department of Anthropology, University of California at Berkeley, USA

Much can be learned about cultural attitudes of violence towards children from analyses of skeletal remains and mortuary patterns of communities in which lived and died. A bioarchaeological approach integrating biological, socio-cultural, and physical environments is used in analyzing a child from Kellis 2, a Roman Period (c. 50-450 AD) cemetery located in Dakhleh Oasis, Egypt. The purpose of this study is to highlight a probable case of malintent towards a child in an archaeological context, thus giving the incident considerable time depth, as this may be the earliest documented case of child physical abuse. The child (B519), aged two to three years, exhibits skeletal fracture patterns consistent with chronic abuse, which may or may not have led to an untimely death. Results from our investigation support this diagnosis. This case presents an opportunity to address questions concerning attitudes towards children, their social experiences, and quality of life during the period of Roman rule in Egypt.

Materials and Methods

Dakhleh Oasis, located approximately 250 km west of the Nile Valley, is one of five major depressions in Egypt's Western Desert. Kellis (*Ismant el-Kharab*), located along an ancient desert trade route, likely housed several thousand people at its zenith in fourth century AD. Kellis was considered an important economic and political hub during this period (Hope 1988). Kellis 2 (K2) extends 150 m east-west and 60 m north-south and is densely filled with rectangular pit graves dug into hard, red Nubian clay. Bodies are placed supine with head to the west and feet to the east, arms to the sides or over the pelvic region, and feet placed side-by-side or crossed. Individuals are typically wrapped in linen shrouds and bound by linen cords.

This child was aged using a combination of diaphyseal length, epiphyseal and dental development. Macroscopic observations of skeletal lesions and fractures were recorded using an Advantix Fuji Nexia 400 digital camera with a macro lens. Lesions and fractures were explored in detail using an Olympus SZX9 stereoscope (cold light source). Digital images were captured at using a CoolSnap-Pro *cf* digital camera (6.3x and 10x magnification) mounted to the stereoscope. Plain film radiographs of skeletal elements were taken using a Faxitron X-ray Cabinet System (Kodak EC1 film, 75-90 seconds at 60kVp and 0.3mA). No screens were used as image quality was found to be superior without.

As part of an exploratory, non-destructive methodology, micro-computed tomography (microCT) was used to distinguish various types of skeletal lesions. A GE Medical Systems Scanner (80 kVp and 450 mA in 2x2 bin mode, 45µ slices) and MicroView 2.0.29 viewer were used to visualize the reactions on the left humerus. For histological analysis, a small section of bone was cut from the right 11th rib and was cleaned and dehydrated using an ascending ethyl alcohol series to remove excess moisture and facilitate complete infiltration of methylmetacrylate resin. Thin sections (70-100µ) were produced from the embedded rib using a Buehler Petrothin system. Microscopic analysis was conducted using an Olympus BX41 upright microscope (polarized and plane light, 40x and 100x magnification) and mounted digital camera. A hilfsobject red 1st order quartz compensator (Olympus model U-P521) was used to aid (Maltese cross pattern in secondary osteons can be seen), aiding in the visualization of collagen bundles and diagenesis (Schultz 2001). Isotopic analyses of skin, hair and nails were conducted at the Laboratory for Stable Isotope Studies, University of Western Ontario using a Costech EA interfaced with a Thermo Finnigan Delta^{plus} XL CF-IRMS. Hair samples were cleaned using 2:1 methanol and chloroform solution, nails and skin were cleaned using 2:1 chloroform and methanol solution. All samples were rinsed and sonicated in deionized and distilled water (30 minutes, dried 48 hours at 50°C) then pulverized prior to weighing. Diagenesis was determined by carbon to nitrogen ratio (2.9-3.6 C:N). Duplicate precision was ±0.2‰ for $\delta^{13}C$ and ±0.3‰ for $\delta^{15}N$.

Results

Distribution of fractures and new bone formation (NBF) are shown in Figure 1. Active cribra orbitalia was noted in both orbits as well as NBF on the temporal and zygomatic processes, and on medial and lateral surfaces of the mandibular condyles. Humeri exhibit complete bilateral fractures of the proximal third of the diaphyses. A callous of new bone bridged across the fracture site on the left humerus, suggesting that the fracture

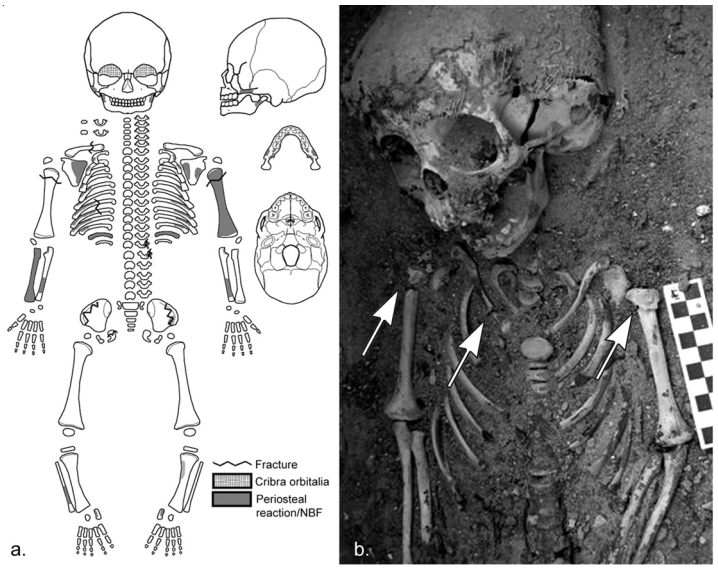

Figure 1. Burial 519. a., illustration showing distribution of periosteal reactions, new bone formation and fractures; b., In situ image of B519 with arrows showing complete fracture of both humeri and right clavicle.

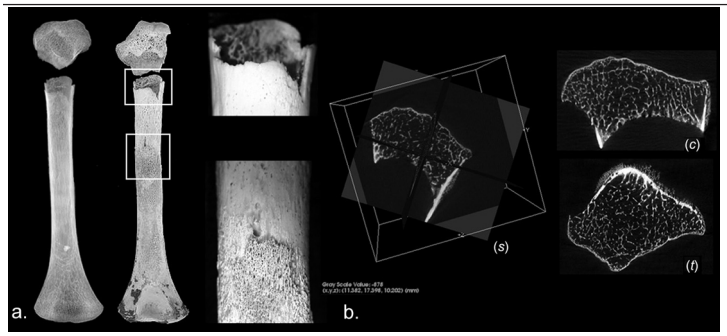

Figure 2. Left humerus. a., radiograph and photograph of left posterior humerus with details (6.5x mag) showing fracture and circumferential SPNBF; b., microCT image capture (GEMS MicroView 2.0.29) of proximal portion of humerus showing sagittal (*s*), coronal (*c*) and transverse (*t*) planes.

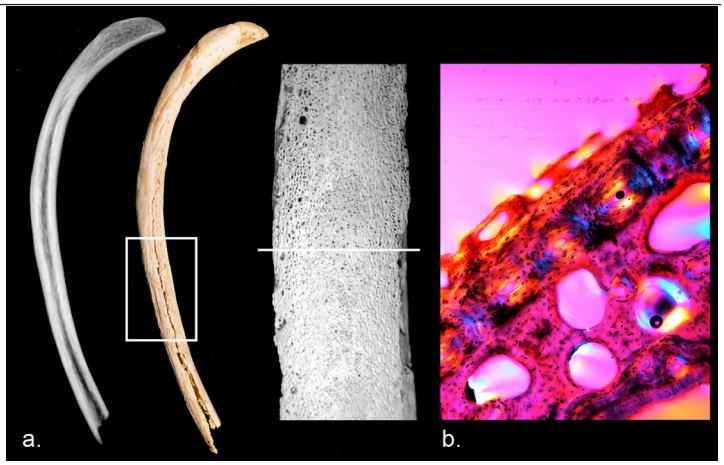

Figure 3. Right 11th rib. a., radiograph and photograph with detail image (6.5x mag) of NBF on visceral surface, white line shows histology section; b., undecalcified thin-section of rib (70µm, 100x mag, polarized light using hilfsobject red first order).

occurred at least 1-2 weeks prior to death (Islam et al. 2000; Klotzbach et al. 2003). Evidence of healing is apparent on margins of both fractures as well as in trabecular bone within proximal portions of the humeri (Figure 2). Periosteal reactions encircle the diaphysis of the right radius. Distal ulnar diaphyses exhibit asymmetrical NBF. There is a complete fracture of the medial right clavicle with no evidence of healing indicating a perimortem occurrence. Both scapulae have NBF on ventral and dorsal surfaces, most prominently at the medial borders and superior and inferior to spinous processes. The right transverse process of the first lumbar and the right portion of the lamina of a lower thoracic vertebra exhibit hairline fractures with some plastic deformation and slight NBF at the fracture site. Two well-healed fractures on the 7th left and 8th right ribs are evidenced by hard callous formations. Most ribs exhibit periosteal reactions on external and visceral surfaces in varying degrees, although NBF is most pronounced on the lower ribs. The right ilium exhibits plastic deformation on the iliac crest. This fracture shows little to no evidence of healing, indicating a perimortem occurrence. The acetabular surface of the right pubis exhibits a fracture in the early stages of healing. The left ilium exhibits a healed compression fracture on the iliac crest along with NBF anterior to the healed fracture. Periosteal reactions are also found along margins of the iliac crest on both ilia and on the right ramus of the ischium. NBF is also seen on: anterior proximal neck and distal metaphyses of femora; medial diaphysis of the left tibia; anterior border of right fibula; floor of the sinus tarsi of calcani; and proximal plantar surfaces of metatarsals.

MicroCT of the left humerus aided in visualization of circumferential NBF and a sclerotic margin directly beneath the fracture site, which was not readily apparent in standard radiographs (Figure 2). Proliferative and unorganized NBF indicates a rapid occurrence, probably as a response to trauma. Histology of the rib section revealed proliferative NBF rather than osteolytic, as no resorption or destruction of the underlying cortex has occurred (Figure 3). The reactive bone is comprised of woven bone and resembles a 'roman aqueduct' formation (Schultz 2001). This NBF implies a non-inflammatory and most likely hemorrhagic origin. Isotopic analyses of tissues ($\delta^{13}C$ and $\delta^{15}N$) were used to determine if physical effects of abuse were reflected through nutritional metabolism over time. Results were compared with those of other children from K2 (Figure 4) (Williams, in prep.). $\delta^{13}C$ values at the time of death generally fall within the range of variation for other K2 children (birth and 4 years); however, hair approximately 2 months prior to death suggests possible use of illness food (i.e., millet gruel) followed by increasing protein intake (Dupras et al. 2001; Williams, in prep). $\delta^{15}N$ value for nail falls within the range for the child's age group, while the skin value suggests that the child was breastfeeding prior to death. $\delta^{15}N$ values hair values deplete by almost 6‰ from the skin, which cannot be accounted for by weaning alone. Response to trauma, infection, or inadequate protein intake, cause net loss of nitrogen in the body. Hair values for B519 strongly indicate response to injury involving dietary protein as the osteoid source for NBF (Katzenberg and Lovell 1999).

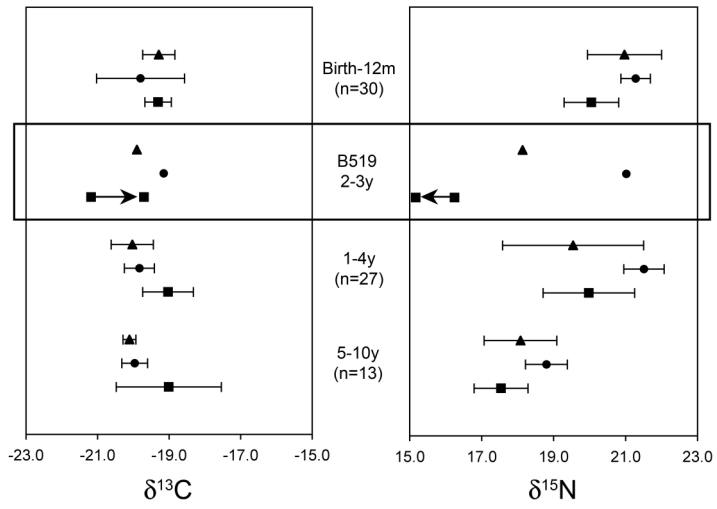

Figure 4. ^{13}C and $\delta^{15}N$ values for nail (triangle), skin (circle), and hair (square) for Kellis 2 juveniles. Box shows values for B519, arrows show change in hair values over last two months of the child's life.

Child Abuse?

Patterns of fractures and skeletal lesions in this individual are suggestive of severe malintent trauma. Clinically, humeral fractures are frequently associated with child abuse (Caviglia et al. 2005). Although proximal humerus fractures most often occur in younger individuals, directed high-energy trauma is needed to produce fractures like those seen in this case (Green and Swiontkowski 2003; Resnick et al. 1996). Furthermore, diaphyseal NBF of the arms is consistent with stripping of the periosteum from bone when an arm or leg is used as a handle (Caffey 1974). Although fractures of the clavicle are the most frequent childhood fracture in clinical cases, fracture of the medial 1/3 portion account for only 5% of clavicular fractures, whereas the middle and lateral 1/3 portions are more common (Brogdon 1998).

Rib fractures, particularly in differential stages of healing, are regarded as virtually diagnostic of child abuse, as they are seldom seen in infants and young children even in response to violent trauma. Patterns of fractures and differential stages of healing in the pelvic bones indicate multiple traumatic events. Their significance of these fractures is unclear due to a dearth of clinical reports regarding child abuse. However, pelvic fractures almost always result from high-energy directed forces. Clinically, close scrutiny of the pubic rami is suggested (Starling et al. 2002). Histologically, the essential natures of the skeletal reactions on the ribs and humeri were highly similar in that they were non-inflammatory proliferative reactions and most likely of hemorrhagic origins, which suggests trauma as its etiology.

It is also important to be aware of conditions producing skeletal changes similar to those resulting from physical abuse. Differential diagnoses of skeletal lesions of child abuse include a variety of diseases (Table 1) (Brill et al. 1998; Cramer and Greene 2003; Resnick et al. 1996). Clinical and archaeological literature reports that hypertrophic osteoarthropathy, hypervitaminosis A, osteomyelitis, and congenital syphilis may also mimic child abuse. These latter diseases were excluded from the differential diagnosis because nearly none of the classic characteristics of these diseases were present.

In order to understand trauma patterns within individuals, it is useful to contextualize those patterns within the larger population. Although population fracture data for K2 is preliminary, only 5% (9/180) of juveniles analyzed exhibit fractures. The isolated nature of B519's fracture patterns, the differential stages of healing, along with varied degrees of asymmetrical NBF, are strongly indicative of chronic physical abuse. However, distribution of NBF on the scapulae and mandible may imply that other agent(s) may be involved in addition to the sustained trauma.

The dearth of publications concerning child abuse in historical and archaeological literature cannot be taken as evidence that violence directed at children was a rare occurrence (Blondiaux et al. 2002; Lewis 2007; Walker 2001; Walker et al. 1997). In fact, evidence relating to maltreatment of children in the Roman Empire is not uncommon. Seneca bluntly recommends that parents should beat a child who is in need of discipline, whether a slave or freeborn (Evans 1991). Given the information reported, it is still unclear how this attitude influenced perceptions of childhood and actions of adults in Roman Egypt.

Table 1. Differential diagnosis of skeletal diseases associated with fractures, NBF, irregular metaphyses, cone-shaped epiphyses alone or in combination.

Condition	Presence
Physiologic NBF	
<6 months	-
Diaphyseal involvement	+
Single-lamellar bone	-
Leukemia	
NBF	+
Leukemic lines	-
Osteolytic lesions	-
Anemia	+
Osteopenia	-
Sclerotic lesions	-
Osteogenesis imperfecta	
Osteopenia	-
Dental malformation	-
Diaphyseal fractures	+
Brittle bone disease	
<1 year	-
Rib fractures	+
Metaphyseal fractures	-
Infantile cortical hyperostosis	
<6 months	-
Severe NBF	-
Mandibular involvement	+
Bilateral involvement	+
Unilateral ribs/mandible	-
Diaphyseal fracture	+
Scurvy	
Diaphyseal fractures	+
Osteopenia	-
Large callus	-
Bilateral involvement	+
Metaphyseal irregularity	-
Rickets	
Diaphyseal fracture	+
NBF	+
Metaphyseal irregularity	-
Osteopenia	-

Ember and Ember (2005) show higher levels of social stratification and political integration, long-term use of alien currency, and societies where non-relative caretakers help raise children predict frequent corporal punishment of children. In addition, societies are likely to practice corporal punishment to prepare children for living with native or imposed power inequality. All of these indicators have historical presence during the period of Roman rule in Egypt. Perhaps discovery of this case signals that some Roman beliefs regarding corporal punishment of children filtered into Egyptian practice, or perhaps child maltreatment seems so aberrant from larger patterns of loving and attentive care that the few cases found rarely find their way into the literature.

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Metric Sex Estimation in an Ancient Egyptian Skeletal Sample

Michelle H. Raxter
Department of Anthropology, University of South Florida

The most reliable technique for estimating the sex of an individual is by identification of morphological characteristics on the pelvis (Phenice, 1969), however, archaeologically recovered skeletal remains are often incomplete or damaged due to decay, weather, as well as animal and human interferences. Development of methods to estimate sex from incomplete skeletal remains is thus necessary. Metric techniques are particularly useful because of the relative ease in application. Human proportions vary systematically between populations (Ruff, 1994; Holliday and Ruff, 1997). These differences can affect metric evaluation of sex (Iscan et al., 1998; King et al., 1998; Gonzalez-Reimers et al., 2000; Mall et al., 2000); therefore the most reliable estimates will be obtained when the population being investigated is as similar as possible in proportions to the population used to create the standards (Holliday and Ruff, 1997).

Metric sex estimation standards have been developed using univariate and discriminant function analysis on long bone measurements from various adult archaeological skeletal samples that include prehistoric Scottish (MacLaughlin and Bruce, 1985), prehistoric Central Californian (Dittrick and Suchey, 1986), prehispanic Canary Islands (Gonzalez-Reimers et al., 2000), prehistoric New Zealand Polynesian (Murphy, 2005), medieval Croatian (Slaus and Tomicic, 2005), and ancient Anatolian (Ozer and Katayama, 2006). To date, the literature contains no metric standards for estimating sex in ancient Egyptians. The goal of the present study is to investigate sexual dimorphism in an adult ancient Egyptian skeletal sample and demonstrate the need for metric sex estimation methods specific to ancient Egyptians.

Materials and Methods

The sample consists of 71 adult ancient Egyptians (male n = 42, female n = 29) predominantly from Predynastic period (c. 3150-3050 BCE) Keneh (n = 25) and Old Kingdom period (c. 2687-2191 BCE) Giza (n = 19). Other time periods and sites represented are Predynastic period Mesaeed (n = 6), Middle Kingdom (c. 2061-1665 BCE) (n = 3), New Kingdom (c. 1569-1081 BCE) (n = 2) and Late period (c. 724-333 BCE) (n = 5) Lisht, Middle Kingdom period Sheikh Fanag (n = 7), and Coptic period (c. 337-641 CE) Kharga (n = 2) and Luxor (n = 2). The samples were collected from the National Museum of Natural History, Smithsonian Institution and the Peabody Museum of Archaeology and Ethnology at Harvard University. Sex was estimated using non-metric identification of characteristics primarily from the pelvis and then also the cranium (White, 2000). Individuals were determined to be adults based on complete epiphyseal fusion of all bones (Ubelaker, 1999).

Eight skeletal dimensions were examined: stature (cm), body mass (kg), maximum vertical diameter of the femur head (FHD) (mm), maximum femur length (XFL) (cm), circumference of the tibia at the nutrient foramen (TC) (mm), maximum length of the tibia (XTL) (cm), maximum vertical diameter of the humeral head (HHD) (mm), and maximum humeral length (XHL) (cm). Long bones were measured following Buikstra and Ubelaker (1994). The mean of the right and left sides of all long bone measurements were used in all analyses. Stature was estimated from maximum femur length using Raxter et al.'s (2007) regression formulae specific to ancient Egyptians. Since age estimates were not available for the individuals, the statures were not corrected for age. Body mass was estimated using FHD, as recommended by Auerbach and Ruff (2004). Multiple analysis of variance (MANOVA) results indicated time period and site had no significant effect ($p = > 0.20$) on any of the dimensions in this particular sample, so the sample was pooled for all subsequent analyses in order to maximize the sample.

Multiple analysis of variance (MANOVA) was used to investigate the effect of sex on the variables. The data was also analyzed by means of discriminant function analysis as well as logistic regression to ascertain the relative contribution of each dimension. Metric sectioning points for estimating the sex of adult ancient Egyptians using FHD, TC and HHD were developed by taking the midpoint between the male and female means for the particular dimension (MacLaughlin and Bruce, 1985; King et al., 1998). Statistics were carried out using Microsoft Excel XP and SYSTAT 11.

Results and Discussion

All the continuous variables are distributed normally ($p = > 0.05$). MANOVA results showed that sex has a significant effect on all the variables ($p = < 0.001$). Histograms reveal body breadth distributions to be more bimodal than body lengths, FHD being the most sexually dimorphic (Figure 1). Coefficient

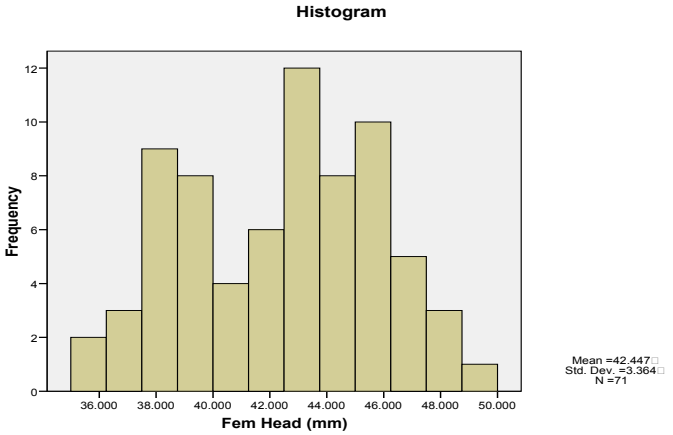

Figure 1. Total pooled sample: Histogram of femur head diameter (mm).

of variation values indicate stature to be the least variable dimension for this sample for both males and females (Tables 1-2). A model was produced using discriminant function analysis with sex as the dependent variable and all eight dimensions as the independent variables. FHD contributed the most to the model (standardized canonical discriminant function coefficient = -0.504), while stature did not contribute at all. Function one correctly classified 93 percent of the males and 93 percent of the females. Logistic regression analyses showed that when a length measurement is considered with a breadth dimension, the predictive power of the model is lowered, with up to 10 percent of the individuals incorrectly classified. These results are consistent with previous studies that have found sexual dimorphism in long bone widths to exceed that of lengths (Iscan et al., 1998; Gonzalez-Reimers et al., 2000).

Single variable analysis is more efficient, more practical in circumstances when bones are damaged or incomplete, and is easier to apply in both the field and the laboratory, as sex can be determined without the need for calculations (Dittrick and Suchey, 1986). Metric sectioning points to estimate the sex of ancient Egyptians is as follows: Femoral Head Diameter: Female < 42 mm > Male; Tibial Circumference: Female < 85 mm > Male; Humeral Head Diameter: Female < 41 mm > Male.

Measurements above the sectioning point are classified as male, below the sectioning point classified as female, and equal to the sectioning point as indeterminate. Each standard correctly classified the sex of 89 percent of the sample, which is not appreciably lower than the 93 percent correctly classified by using multiple variables with discriminant analysis. These percentages are comparable to that of Dittrick and Suchey (1986) (91%, FHD; 90%, HHD) and Iscan et al. (1998) (90%, TC).

When alternate sectioning points were tested, the percentage of correctly classified Egyptians is considerably lowered (56% TC, using Symes and Jantz, 1983; 54%, FHD

Table 1. Descriptive statistics for male Egyptian skeletal dimensions (n = 42).

	Body Mass (kg)	Stature (cm)	FHD (mm)	XFL(cm)	TC (mm)	XTL(cm)	HHD (mm)	XHL(cm)
Minimum	53.03	154.65	40.85	40.20	79.50	32.80	40.20	27.20
Maximum	74.76	180.37	49.40	51.60	107.00	41.10	49.70	35.25
Mean	63.54	166.06	44.65	45.26	91.23	37.47	43.91	31.90
Median	63.78	165.76	44.48	45.13	90.5	37.28	43.55	32.03
St. dev.	5.78	4.84	2.09	2.15	5.82	1.80	2.16	1.50
Coeff. of Var.	0.09	0.03	0.05	0.05	0.06	0.05	0.05	0.05

Table 2. Descriptive statistics for female Egyptian skeletal dimensions (n = 29).

	Body Mass (kg)	Stature (cm)	FHD (mm)	XFL(cm)	TC (mm)	XTL(cm)	HHD (mm)	XHL(cm)
Minimum	41.44	146.83	35.60	38.40	73.50	31.30	32.80	26.20
Maximum	59.60	165.43	43.95	46.35	89.00	38.10	43.20	32.15
Mean	49.30	154.23	39.25	41.56	79.50	34.58	38.12	29.11
Median	49.27	154.32	39.20	41.60	79.00	34.80	37.90	29.20
St. dev.	4.38	47.74	2.01	2.02	4.21	1.82	2.23	1.50
Coeff. of Var.	0.09	0.03	0.05	0.05	0.05	0.05	0.06	0.05

and 51%, HHD, using Stewart, 1979). Ancient Egyptians possessed more gracile body plans (Masali, 1972) in comparison to the modern American Blacks and Whites examined by Stewart (1979) and Symes and Jantz (1983), so that the greater sectioning points presented in their studies resulted in misclassification of ancient Egyptian males.

Conclusions

It is necessary to develop metric sex methods due to the common circumstance of incomplete or damaged archaeologically recovered skeletal remains. FHD was found to be the best discriminator between the sexes for this study's ancient Egyptian sample. Consistent with previous studies' findings, body breadths were shown to distinguish the sexes better than lengths. The need to create metric sex methods specific to ancient Egyptians was also demonstrated, as the use of standards derived from other populations resulted in appreciably lower percentages of correct classification of sex. New sectioning points for estimating the sex of ancient Egyptians using FHD, TC and HHD were presented, correctly classifying the sex of 89% of the sample.

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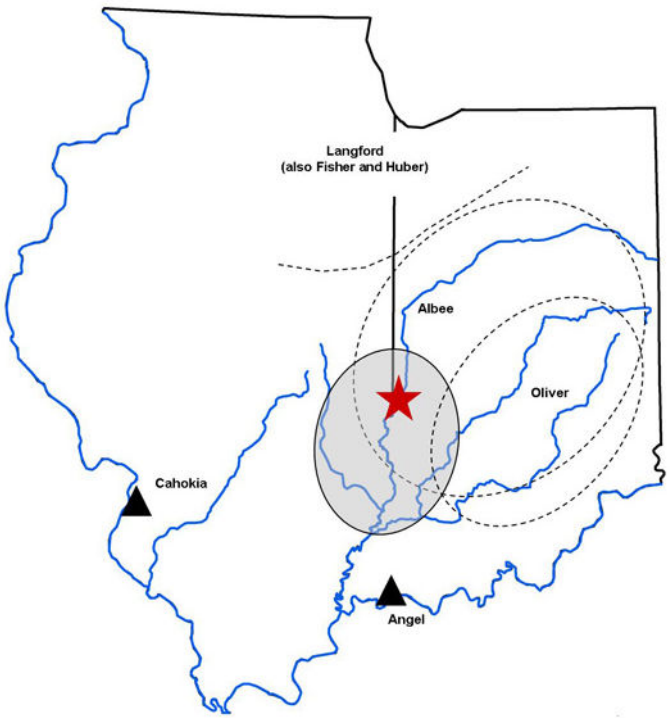

Figure 1. Map of the Secondino and Shew sites (star), Vincennes culture area (gray ellipse), and neighboring culture areas in Indiana and Illinois.

Stable Isotopic Relationships between Age, Sex, and Maize Consumption in the Mississippian Vincennes Phase of Indiana

Joshua J. Wells and Carlina de la Cova
Department of Anthropology,
Indiana University, Bloomington

The Vincennes Mississippian phase was centered on the middle Wabash River drainage from AD 1050-1450 (Figure 1). Influences from Cahokian Illinois introduced the Mississippian tradition to the region (Riley and Apfelstadt 1978; Wells n.d.). Contemporary Late Woodland and Upper Mississippian traditions, such as Albee, Oliver, and Langford, were also influential (Carpenter and Pace 1985; Jackson and Pace 1986; Pace and Apfelstadt 1974; Wells n.d.).

Twenty-nine individuals from burial mounds with Vincennes components were subjected to stable isotopic, dental, and osteological analyses to generate data on dietary patterns. The isotopic study is the focus of this paper, demonstrating that women and infants (perhaps of both sexes) who were of high status may have been prescribed maize, but maize was proscribed from high status men.

All individuals were from two adjacent glacial knolls used as intrusive burial mounds. Secondino Mound (12VE18) and Shew Mound (12VE25) are about 800 m apart in Vermillion County, Indiana. Vincennes burials often exhibited Late Woodland and Mississippian traits in mortuary arrangements and artifacts. Similar practices appear in dietary patterns (Wells n.d.). Intensification of maize agriculture does not appear to have been significant here in the process of culture change from a Late Woodland to Mississippian form, generally described as "Mississippianization."

Maize cultivation provided a caloric staple for consumption and storage. It was also the center of social and spiritual behaviors among numerous Native American groups including archaeologically and ethnohistorically recognized Mississippians. Important events revolved around maize, like the Green Corn Ceremony of the Chickasaw, or the Natchez Feast of the Great Corn. Heavy consumers of maize could be high-status individuals in their communities, especially early in the Mississippianization process when maize may have provided an important focal point for social control (Rose et al. 1991). Individuals from dispersed households could be low consumers of maize (Hogue and Peacock 1995). However, heavy consumers could also hold lower ranks, like many sacrificial women from Cahokia's Mound 72 (Ambrose et al. 2003).

Methodology

Twenty-nine individuals were subjected to stable isotopic analyses and fluoride dating. Stable isotopic analyses of carbon and nitrogen from human bone collagen provide data about the dietary patterns of past groups. Carbon-13 (^{13}C) is an isotope of carbon frequently analyzed in skeletal elements by North American archaeologists to gauge the maize component of a diet. Maize, a tropical grass, contains a higher residual amount of ^{13}C in its composition than eastern North American flora, including aboriginal cultigens (Lynott et al. 1986:52).

The fractionation factor measures the level of an isotopic element in a test sample. For carbon, fractionation is expressed as the difference in the ratio of rare ^{13}C to abundant ^{12}C between the bone and a standard Peedee Belemnite (PDB) baseline (Schoeller 1999). The difference between a sample and the PDB standard is signified with delta notation ($\delta^{13}C$). For example, a $\delta^{13}C$ of -13.7 $^{0}/_{00}$ is the average in the eastern Ozarks after AD 1000 (Lynott et al. 1986), and a $\delta^{13}C$ of -9.0 $^{0}/_{00}$ is the average at the Angel site in southern Indiana (Schurr 1992), where a *less negative* number indicates more ^{13}C in the sample. The average ^{13}C level of the Angel sample is greater than the Ozark sample, suggesting that Angel people in general ate more maize, barring any sampling contingencies (Ambrose et al. 2003; Schurr 1992) or trophic enrichment from breastfeeding (Fuller et al. 2006; Schurr 1997).

Stable isotope analyses of dietary nitrogen measure amounts of rare ^{15}N relative to abundant ^{14}N. These are also reported with delta notation ($\delta^{15}N$). Higher values are equated with higher trophic level subsistence, related to the consumption of terrestrial or aquatic meat in a human diet (Schoeninger and DeNiro 1984; Schurr 1992). Breastfeeding has been linked to enrichment of individual's ^{15}N in archaeological (Schurr and Powell 2005) and living (Fuller et al. 2006) populations. Depletion of ^{15}N can result from a diet containing legumes (DeNiro and Epstein 1981).

The Secondino and Shew burials were temporally ordered, respectively, through fluoride dating utilizing an ion selective electrode. Buried bones accumulate fluoride ions from groundwater that can be used to order specimens from identical burial conditions (Schurr 2001). The mounds have different soil compositions, so the fluoride sequences are not comparable. Mortuary practices and recovered artifacts suggest that the Vincennes burials were interred somewhere in the time span AD 1000-1200 (Wells n.d.).

Nineteen individuals yielded valid stable isotopic data, and could be definitively placed in the Vincennes Mississippian era by their fluoride levels. The $\delta^{13}C$ and $\delta^{15}N$ values from Secondino and Shew are not significantly different in a t-test including all age ranges, nor when examining adults only. Within a combined Secondino-Shew group, females, males, and unsexed adults do not have significantly different means in *t*-tests, nor in variances in ANOVA on $\delta^{13}C$ and $\delta^{15}N$ values (Figures 2 and 3). However, the range for male $\delta^{13}C$ values is broader negatively, indicating less overall maize consumption. Two males have $\delta^{13}C$ values below -20 $^{0}/_{00}$ (indicative of maize free diets), and three others have $\delta^{13}C$ values around -15 $^{0}/_{00}$ (indicative of moderate maize consumption). Two adult females yielded $\delta^{13}C$ values of -13.6 $^{0}/_{00}$ (20-34 years) and -17.1 $^{0}/_{00}$ (35-50 years).

In *t*-tests on $\delta^{13}C$ values, adults (males, females, and unsexed) and infants had significantly different means (p = 0.046). Adults and juveniles over three years were not significantly different. A combined set of adults and juveniles had a mean significantly different (p = 0.043) from that of the infants. For comparisons with other datasets, different sample mean $\delta^{13}C$ values should be used: adults and juveniles $\delta^{13}C$ = -16.3 $^{0}/_{00}$ (s = 3.3; n = 17); infants $\delta^{13}C$ = -11.0 $^{0}/_{00}$ (s = 3.3; n = 2) (Figure 4).

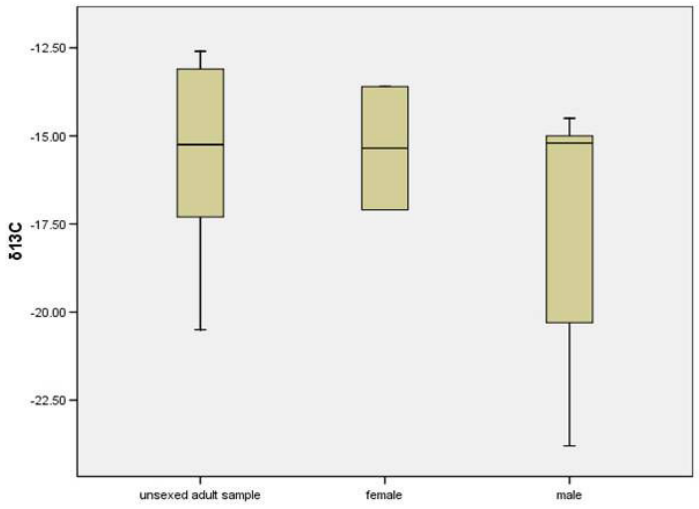

Figure 2. Boxplots comparing non-infant $\delta^{13}C$ values by sex.

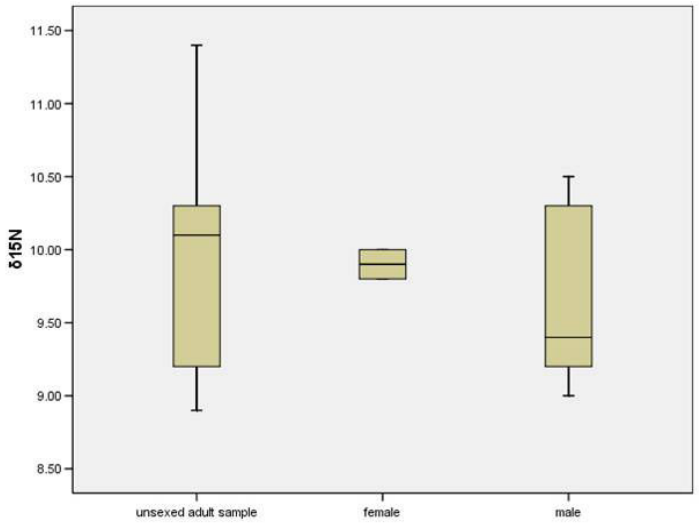

Figure 3. Boxplots of $\delta^{13}C$ values, comparing adults and juveniles with infants.

In *t*-tests on $\delta^{15}N$ values, all adults and older juveniles as a group had a significantly different mean than infants and young juveniles (p = 0.001). Sample means were: adults and older juveniles $\delta^{15}N$ = 9.8 (s = 0.6; n = 16); infants and younger juveniles $\delta^{15}N$ = 11.1 (s = 0.3; n = 3) (Figure 5). This corresponds with patterns of heightened ^{15}N levels for breastfeeding described in archaeological (Schurr 1997, 1998; Schurr and Powell 2005) and living (Fuller et al. 2006) populations.

Secondino burial 955-2, a young juvenile under 3 years of age was included with adults and juveniles for ^{13}C and infants for ^{15}N. This individual's isotope levels suggest that it died during or soon after a weaning period. Data from living mother-infant

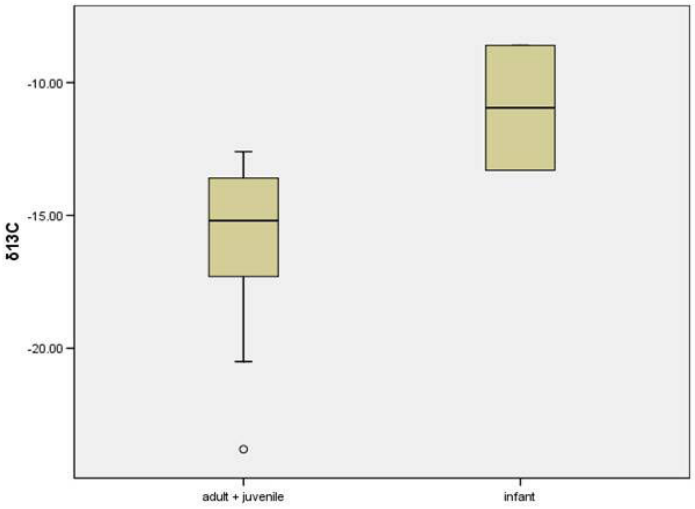

Figure 4. Boxplots comparing non-infant $\delta^{15}N$ values by sex.

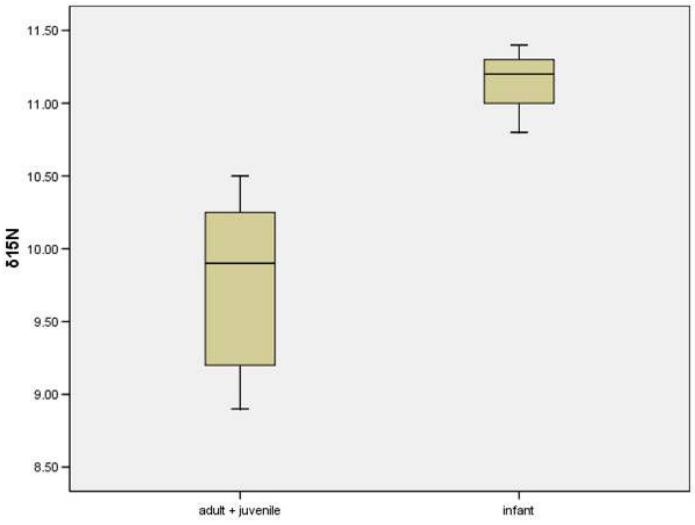

Figure 5. Boxplots of $\delta^{15}N$ values, comparing adults and juveniles with infants.

breastfeeding pairs indicate that "During the weaning process, the $\delta^{13}C$ results for breastfed infants [declines] to maternal levels more rapidly than $\delta^{15}N$ results" (Fuller et al. 2006:279), after an enrichment of about 1 $^{0}/_{00}$.

Discussion

Based on this study, maize consumption appears to have been more ideologically important than substantially necessary in Vincennes society. A few individuals show levels of consumption comparable to groups that are considered highly maize dependent (c.f. Schurr 1992). Maize consumption may have been important to female and infant roles within Vincennes society, producing "an identity-making and evoking experience whatever the feelings of association. Commensal acts … weave individuals, families, and communities together on a regular basis, in mental constructs as well as through the pragmatics of keeping 'food on the table.' Food therefore is the original social glue that forms the bonds of family and society while creating the individual" (Atalay and Hastorf 2006).

Vincennes ideals concerning maize consumption appear to have focused upon certain individuals (fertile females and infants) rather than kin or status groups. A study of relationships between dietary intake and workloads within swidden agriculturalist households in Madagascar showed that all household members can receive differentially nutritional foodstuffs dependent upon their perceived contributions to the household. "Infants, toddlers and pregnant mothers are … served rice which is thought to give more *force* [emphasis original]," (Hardenbergh 1997) and specific household contexts were variable (cf. Backstrand et al. 1997; DeRose et al. 2000).

A group interment from Secondino of an adult female and male, unsexed juvenile (again 955-2), and infant, provides an example. The high status male was buried with an ochre filled pipe and a Mississippian bottle, and did not consume maize ($\delta^{13}C$ -23.8 $^{0}/_{00}$). The juvenile consumed maize minimally ($\delta^{13}C$ -17.3 $^{0}/_{00}$). The male and juvenile also had healthy dentitions. The female had a high caries incidence indicative of heavy maize consumption, but did not yield valid isotopic data. The infant yielded no valid isotopic data. In combination, these data suggest differential adult male and female roles that respectively precluded and prescribed the consumption of maize. Dietary behaviors particular to individuals were not necessarily imposed upon their spouses and offspring (or siblings and siblings' children?). Maize avoidance or consumption by individuals may have been a matter of personal responsibility.

Another example is found in the $\delta^{13}C$ levels of two Shew mound infants, both about 18 months in age, from opposite ends of the fluoride timeline for that mound. The earlier infant exhibits a $\delta^{13}C$ (-8.6 $^{0}/_{00}$) strongly associated with maize consumption, the later infant is still strongly associated but less so ($\delta^{13}C$ -13.3 $^{0}/_{00}$). Locally large amounts of maize entered their bodies through either breastfeeding, food, or a weaning combination. Both infants were buried with substantial amounts of shell wealth. These infants (through their mothers) may have been prescribed maize heavy diets concomitant with important social standings that compelled shell wealth with their burials were those individuals to die.

A supportive comparison is made between the two adult females with valid $\delta^{13}C$ values, the younger (of reproductive age) consumed noticeably more maize than the older (likely beyond reproductive age). The younger female had numerous dental and osteological defects likely related to maize consumption. The older female exhibited lesser dental wear and porotic hyperostoses.

Another comparison is between the Shew shell burial infants and Secondino juvenile 955-2 (from a high status family). A child between 2 and 3 years of age, like 955-2, although not self sufficient, can both comprehend and perform commensal rules. 955-2 was likely weaned and had a significantly lower $\delta^{13}C$ than the infants and the adult-juvenile sample mean.

Conclusion

Maize was a cereal that accounted for about one-third of dietary protein among Vincennes people generally, and likely had ritual value that required its elevated consumption by nursing women or solid-food tolerant infants (perhaps of both sexes) who were of social importance. Moderate maize consumption was probably adopted by Vincennes people in general, but it was likely avoided by men who were of social importance.

Limited production and specific consumption of maize in the Vincennes phase, instead of intensive agriculture, may have followed the expansion of Cahokian-originated fertility cults into the region after AD 1050. Artistic expressions of these beliefs are seen in the Cahokian Birger and Westbrook figurines of female deities who could alternately have been invoked for assistance with crops, fertility, and healing (Prentice 1986; Reilly 2004:134).

"Food is used to comment on the sacred and to reenact venerated stories … In consecrated contexts, food 'binds' people to their faiths through 'powerful links between food and memory,'" (Feeley-Harnik 1994 in Mintz and Du Bois 2002:107). The consumption or avoidance of maize by certain people in Vincennes society could create a pattern of continuous cultural reproduction, synchronized with biological reproduction. Maize could promote the growth and health of the group, even as it fueled the growth and health of specific individuals.

Acknowledgements

The Indiana University (IU) Graduate School funded analyses (Grant-in-aid of Research). Raw isotopic and fluoride data were produced at Notre Dame University's Fluoride Dating Center, directed by Dr. M. R. Schurr. Indiana State University's Anthropology Laboratory, directed by Dr. C. R. Stafford, and IU's Glenn A. Black Laboratory of Archaeology (GBL), directed by Dr. C. S. Peebles, permitted sampling of the Secondino and Shew collections. Wells' work was funded by GBL (Prehistory Research Fellowship). Dr. D. C. Cook at IU provided guidance. All errors belong to the authors.

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Bioarchaeology

Gordon F.M. Rakita, Associate Editor

Thirty years ago, Jane Buikstra coined the term "bioarchaeology" to describe a new perspective in prehistoric studies (Buikstra 1977). Following Buikstra's 1977 model, I have previously defined bioarchaeology in the pages of this column thusly:

"Bioarchaeology is the scientific study of archaeologically recovered human remains. It is an endeavor that is regional and diachronic in scope, based in the analysis of populations as well as individuals. It is biocultural in outlook, explanatory rather than descriptive, and above all, emphasizes the scientific answering of anthropological research questions, not simply archaeological or physical anthropological ones. The approach is concerned with understanding human skeletal biology within the context of human social, funerary and ritual behavior. Bioarchaeologists use scientific methods developed in archaeology, physical anthropology, and allied fields."

As this edition of the *SAS Bulletin* and some of the articles recently published within the pages of this venue demonstrate, bioarchaeology is a flourishing scientific approach. Indeed, Alan Goodman, the President of the American Anthropological Association recently noted (Goodman 2007) that "bioarchaeology is a thriving cross-subfield specialty."

In this brief column, I would like to explore some of the more recent history of the field. In particular, I would like to highlight recent publication trends within the field, with special attention to some key publications. To do so, I conducted a brief search of the ISI Web of Science (http://scientific.thomson.com/products/wos/) database for works published between 1990 and 2007 with either "bioarchaeology" or "bioarchaeological" in the title. This quick-and-dirty search gives us a fair snapshot of recent publishing trends in the field. For more detailed studies in this vein, please consult Stojanowski and Buikstra (2005) and Buikstra and colleagues (2003).

Figure 1 shows the number of various types of publications with either "bioarchaeology" or "bioarchaeological" in the title published in the journals indexed by the Web of Science. These journals include the *International Journal of Osteoarchaeology*, the *American Journal of Physical Anthropology*, the *American Journal of Human Biology*, *American Anthropologist*, *American Antiquity*, *Anthropological Science*, the *Journal of Human Evolution*, and, of course, the *Journal of Archaeological Science*. According to my search (conducted on Oct 11th, 2007) 111 different publications matched the search parameters. Sixteen (or 14%) were articles, thirty-nine (35%) were book reviews, forty-nine (44%) published meeting abstracts, and seven (6%) corrections, editorial materials, and other publications. Overall, the trend for the past fifteen years has been one of increasing numbers of bioarchaeological publications.

Interestingly, this rise in the number of publications in bioarchaeology has occurred concurrently with the publication of a number of important volumes (both edited and authored) that have also been released in the last fifteen years. To begin with, in 1991, *What Mean These Bones? Studies in Southeastern Bioarchaeology* (Powell et al. 1991) summarize the first decade and a half of developments in the field of Bioarchaeology. This and the original volume edited by Robert Blakely in 1977 highlight the origins of the program in the Southeastern U.S. But Powell and colleagues volume also demonstrated the emerging potential of the nascent perspective.

The year 1994 saw the publication of *Standards for Collection of Data from Skeletal Remains* (Buikstra and Ubelaker 1994). This work offered the first systematic protocol for the coding of scientific data collected from human skeletons

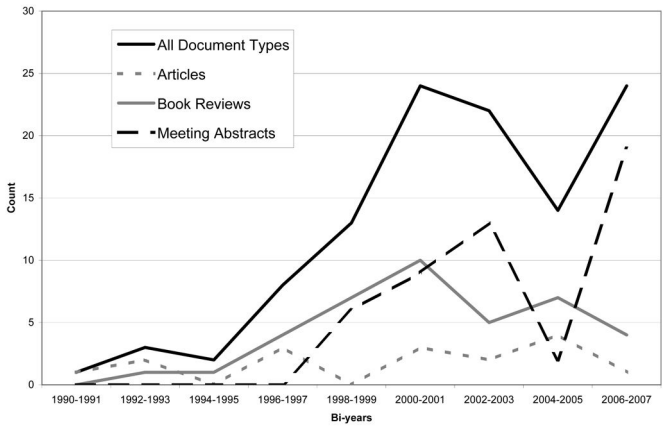

Figure 1. Trends in bioarchaeology related publications as indexed by the Web of Science.

and did so during the widespread museum collection processing brought about by the Native American Graves Repatriation and Protection Act (NAGPRA) of 1990. In subsequent years, the frequency of bioarchaeology publications increases, driven in part by reviews of books, but more importantly, by publications of meeting abstracts that focus on bioarchaeology (particularly at the annual meetings of the American Association of Physical Anthropologists).

Standards (as it has come to be known) was followed by three influential volumes authored or co-authored by Clark Spencer Larsen. These include *Bioarchaeology of the Stillwater Marsh* (with Robert L. Kelley) in 1995, *Bioarchaeology: Interpreting Behavior from the Human Skeleton* in 1997, and *Skeletons in Our Closet: Revealing Our Past through Bioarchaeology* in 2000. These and numerous other volumes, articles, and chapters in edited volumes established Larsen as one of the most prolific bioarchaeologist of the past fifteen years.

The last five years have witnessed the publication of a variety of new volumes that both reflect past research interests and history as well as define new theoretical and methodological venues for bioarchaeology. In 2003, Roberts and Buikstra published *The Bioarchaeology of Tuberculosis: A Global View on a Reemerging Disease* and 2005 saw the publication of Powell and Cook's cleverly named volume on treponematosis: *Myth of Syphilis*. Both of these volumes re-examine pathological conditions that have been perennial topics for bioarchaeologists.

When initially defined, the process of bioarchaeology was not presented as a random affair. Buikstra (1977: 70; Buikstra 2006: xviii-xix) was quite clear that preliminary work should begin with a systematic examination of mortuary practices. Burial customs can play havoc with the representativeness of skeletal samples and researchers should not assume a one-to-one correspondence between samples and living communities. Thus bioarchaeologists have an overriding concern with mortuary practices and the processes by which skeletons variously enter the archaeological record. This concern has been demonstrated by two edited volumes that examine these processes; Beck's (1995) *Regional Approaches to Mortuary Analysis* and Rakita et al.'s *Interacting with the Dead* (2005).

Finally, Buikstra and Beck have assembled the most recent synthesis of the field in their *Bioarchaeology: The Contextual Analysis of Human Remains* (2006). This sixteen chapter volume brings together leading bioarchaeologists to explore the historical underpinnings of the approach, examine current state-of-the-art methodologies, and consider the future of the perspective. Far from being the last word on bioarchaeology, this volume will surely spur ever more advanced lines of research.

Clearly, as the articles in this special issue of the *SAS Bulletin* attest to, bioarchaeology is a robust scientific perspective that has moved out of its adolescence and into the full bloom of a mature discipline. No doubt subsequent decades will see the publications of additional "classics."

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Archaeological Chemistry

Nora Reber, Associate Editor

This update contains information about upcoming and recent conferences, as well as new books on archaeological chemistry.

Upcoming Conferences

The Eastern Analytical Symposium will take place November 12-15 at the Garden State Convention Center and Hotel in Somerset, NJ, United States. Mass spectrometrists will be excited by the two sessions on Mass Spectrometry in Anthropology and Archaeology, arranged in conjunction with the New York Conservation Foundation. The first session will be chaired by Drew Coleman of the University of North Carolina at Chapel Hill and John Scott of the New York Conservation Foundation. Use of MS for sourcing techniques is covered by "Using Secondary Ion Mass Spectrometry to Source Turquoise" by Mostafa Fayek and Sharon Hull of the University of Manitoba, and "Application of Radiogenic Isotope Geochemistry to Archaeological Sourcing Experiments" by Drew Coleman and John J. W. Rogers of the University of North Carolina at Chapel Hill. Randall Law and James Burton of the University of Wisconsin, Madison discuss an interesting application of lead isotope analysis in "Nondestructive Pb Isotope Sampling and Analysis of Harappan Lead and Silver Artifacts Using EDTA and ICP-MS." Randall Law will present "Geoscience and Mass Spectrometry in Anthropology and Archaeology" towards the beginning of the session, while Neal Gupta, Derek Briggs, and Roger Summons, all of either Yale University or MIT conclude the first session with "Application of Analytical and Mass Spectrometric Techniques to Elucidate the Structure and Isotopic Composition of Fossil Organic Matter."

The second mass spectrometry session will be chaired by Randall W. Law of the University of Wisconsin, Madison and John Scott of the New York Conservation Foundation. This session will include "Accelerator Mass Spectrometry Dating and Agricultural Crop Histories in Eastern North America," by John Hart of the New York State Museum, "A North American Southeast Native Source of Caffeine: *Ilex vomitoria* and the "Black Drink" by Eleanora Reber of the University of North Carolina at Wilmington (yours truly, who will not be presenting the paper in person due to an upcoming maternity leave), "Characterization of Organic Matter in Rock Paintings: Binder or Background?" by Ruth Armitage of Eastern Michigan University, and "Some Applications of Laser Ablation-Time of Flight ICP-MS in Archaeology," by Hector Neff and John Dudgeon of California State University, Long Beach. Slightly related to archaeological chemistry is "An Evaluation of Supercritical Drying and PEG/Freeze Drying of Waterlogged Archaeological Wood" by Schindelholz et al.

The 73rd Annual Meeting of the Society for American Archaeology will be held March 26-30, in Vancouver, Canada. The preliminary program will be available in mid-December, 2007 at http://saa.org/meetings/prelimProgram.html. Hopefully, there will be some great archaeological chemistry!

The 25th Center for Archaeological Investigations Visiting Scholar conference will be on the topic "Human Variation in the New World: A meeting of archaeology and biological anthropology." The conference will take place on 25-26 April, 2008 at Southern Illinois University at Carbondale. The call for abstracts is forthcoming—please contact Benjamin Auerbach at auerbach@siu.edu for further information.

The 37th International Symposium on Archaeometry will be taking place May 12-16, 2008, at the Complesso Didattico del Laterino, in Siena, Italy. Abstracts are due by December 1, 2007. Sessions include: Field archaeology, including remote sensing and geophysical prospecting; archaeo-chronometry, including dating techniques and cultural phase analysis, with a special sub-session on recent developments in radiocarbon dating; Human-environment interactions; bioarchaeology, including a sub-session on food preparation in antiquity; stone, plaster, and pigments; ceramics, glazes, glass, and vitreous materials; metals and metallurgical ceramics; and integrated site studies. The special theme for Siena is 'Micro/nano diagnostic and ancient technology.' For further information, visit the symposium website at http://www.unisi.it/eventi/isa2008/index.htm.

The 6th World Archaeological Congress will be held in Dublin, Ireland on June 29-July 4, 2008. The deadline for paper and poster proposals is February 22, 2007. There are many themes for the Congress, but 'Rainforest as Artefact' and 'Wetland Archaeology' might be particularly interesting to archaeological chemists. More information is at the congress website, http://www.ucd.ie/wac-6.

Recent Conferences

The XVI International Materials Conference was rescheduled from mid-August to October 28-November 1 in Cancun, Mexico, due to Hurricane Dean. There was a session on "Archaeological and Arts Issues in Materials Science" chaired by Dr. José Luis Ruvalcaba Sil. Further information is not yet available at press time. For further information, including an entertaining (in a way) account of the process undergone by the organizing committee as they rescheduled the conference, visit http://www.amcm.org.mx:81/imrc2007.

The 23rd International Meeting on Organic Geochemistry was held September 9-14, 2007 in Torquay, United Kingdom. There was an entire session on Archaeological chemistry, chaired by Jacques Connan. Evershed, James, Mukherjee & Pfälzner gave a paper on "Biomarker reconstructions of ritual activities in a near eastern Bronze Age royal tomb," Charrié-Duhaut, Connan, Darnell, Bissada, Spangenberg & Albrecht presented "Molecular characterisation of a widely used outside coating of a French shipwreck (18th Century AD)" and Jacob, Disnar, Arnaud, Chapron, Debret, Lallier-Verges, Desmet & Revel-Rolland discussed "Millet cultivation history in the Alps

during the last 6000 years as revealed by a sedimentary biomarker." Also of potential interest to archaeological chemists were two paper sessions and one poster session on paleoclimate, and one on soil chemistry. The proceedings of this conference will be published as a volume of the journal *Organic Geochemistry*, though the exact date is TBA. For further information and a complete program, you can visit http://www.imog2007.org.

The Goldschmidt 2007 conference on geochemistry took place August 19-24, 2007 in Cologne, Germany. A session on Archeometry chaired by Sabine Klein & Wolfgang Müller contained many papers of interest. Some notable contributions include "The Building Stones of the Khmer-Temple at Angkor/ Cambodia: A Petrological and Geochemical Approach Towards a Conservation Oriented Characterisation of the Inventory," by Reucher et al., "Reconstructing ancient commercial routes between the Roman Empire and the Indian subcontinent via lead isotope ratio analysis," by de Muynck et al., "Osmium Isotopes as a Provenance Tracer? A Case Study from Cabrières" by Klemm et al., and "Historical Carbonate Mortar and Plaster, Proxies for Ancient Environments," by Kosednar-Legenstein et al. Sourcing papers included "Petrochemical Characterisation of Natural Stones from the Etruscan Site of Marzabotto (Bologna-Italy): Preliminary Results" by Lugli et al., "Geochemical Characterization of Obsidian Subsources from the Coso Range, California, USA" by Draucker et al., and "Pb Isotope Provenance Study of Irish Bronze Age Gold using LAICP-MS" by Pike et al. Two different approaches to tooth analysis were represented by "LA-MC-ICPMS Sr/ Sr Analysis on Tooth Enamel . Pitfalls and Problems" by de Jong et al. and "Elemental and Sr Isotope Investigations of Human Tooth Enamel by Laser Ablation-(MC)-ICP-MS: Successes and Pitfalls" by Simonetti et al. "Natural Pigments as Enamel Opacifiers on Ancient Glass: Raman Study of Lazurite Colour Decoration on 1st to 2nd Century Glass Vessels from Lubieszewo (Lübsow), Poland" by Greiff et al. was the sole manmade glass paper in the session.

Books

Archaelogical Chemistry #968: Analytical Techniques and Archaeological Interpretation (Archaelogical Chemistry) by Michael D Glascock, Robert J Speakman, and Rachel S Popelka-Filcoff was released on July 25, 2007. This volume is the proceedings of a symposium at the 231st National Meeting of the American Chemical Society, March 26-27, 2006 in Atlanta, Georgia, and is sponsored by the ACS Divisions of Nuclear Chemistry and Technology and the History of Chemistry. It includes 28 papers on the use of analytical techniques to answer specific archaeological problems.

The release of the 2nd edition of *Archaeological Chemistry*, by Zvi Goffer and James D. Winefordner was apparently delayed for yet a third time, and was finally released on October 12, 2007. It is now subtitled "Chemical Analysis: A Series of Monographs on Analytical Chemistry and Its Applications" and has a colorful hard cover. Otherwise the contents appear unchanged from the descriptions published previously in this column.

Both the hardcover and softcover editions of *Analytical Chemistry in Archaeology* by A. M. Pollard, C. M Batt, B. Stern, and S. M. M. Young came out on January 29, 2007. Since it came out some months ago, many of our readers may have already read this manual on the basic chemistry underlying archaeological chemistry. For our more chemically oriented readers, it is very helpful for students or archaeologists attempting to hold intelligent conversations on the subject of archaeological chemistry.

Some entertaining applications of archaeological chemistry can be found in *New Perspectives on Human Sacrifice and Ritual Body Treatments in Ancient Maya Society* edited by Vera Tiesler and Andrea Cucina, released on March 14, 2007. Another fun read somewhat related to archaeological chemistry is *Water of Life: A History of Wine-Distilling and Spirits; 500 BC - AD 2000* by C. Anne Wilson. This came out in late February, 2007.

Archaeological Ceramics

Charles C. Kolb, Associate Editor

The column in this issue includes seven topics**:** 1) Reviews of Books on Archaeological Ceramics; 2) Other Ceramic Resources; 3) FAMSI Reports on Mesoamerican Ceramics; 4) Previous Meetings; and 5) Forthcoming Meeting.

Susan I. Rotroff, *The Athenian Agora, Results of Excavations Conducted by The American School of Classical Studies at Athens, Vol. XXXIII: Hellenistic Pottery: The Plain Wares*. Princeton, NJ: The American School of Classical Studies at Athens, 2006. xxxvii + 441 pp., 106 figs., 90 pls., ISBN-13: 978-087661-233-0, ISBN-10: 0-87661-1233-8, 95.00/$150.00. The author is a well-known, highly-regarded archaeologist who specializes in the Classical and Hellenistic periods. Rotroff (Jarvis Thurston and Mona Van Duyn Professor in the Humanities, Department of Classics, Washington University, St. Louis, Missouri), earned her bachelor's degree in Greek and in Classical and Near Eastern archaeology from Bryn Mawr College in 1968 and received a Master's degree in 1972 and a doctorate in Classical archaeology in 1976, both from Princeton University. Her primary research focus has been the ancient Mediterranean, combining artifact analyses with the study of archival and textual records. She currently teaches courses in ancient Greek as well as in the archaeology of the Greek and Roman worlds. As a Classical archaeologist, she employs the analysis of material culture in order to illuminate the culture and behaviors of ancient human societies. In the main, Rotroff uses ceramics to achieve these objectives and has, since 1970, been affiliated with the excavations of the Athenian Agora in Athens as well as at Troy and Sardis in Anatolia, and at Carthage, in North

Africa. Recently she has begun a study of pottery from a survey project in southern Euboia.

The volume under review is a recent addition to the nearly three dozen scholarly works published previously that report the results of excavations at the Athenian Agora by the American School of Classical Studies at Athens. Twelve volumes have already been published on Roman ceramics, terracottas, lamps, ostraka, Geometric and Protoattic wares, and Black and plain ceramics. This is the third Agora publication prepared by Rotroff, who previously authored *The Athenian Agora XXII: Hellenistic Pottery: Athenian and Imported Moldmade Bowls* (1982) and *The Athenian Agora XXIX: Hellenistic Pottery: Athenian and Imported Wheelmade Table Ware and Related Material*, 2 vols. (1997). Collectively, this trilogy of publications has taken Rotroff more than 30 years of intensive, detailed research initially focusing on the most identifiable and quantifiable corpus of Athenian and imported materials, then the mold-made bowls, followed by table wares and affiliated pottery. The Herculean task of defining and quantifying the variations within the corpus of plain ceramics remained to the end but has been worth the wait. In this third publication she documents 847 examples of Hellenistic plain wares excavated from the Agora, including oil containers, household, culinary, and cooking wares. Rotroff correctly observes that there are very few people who are engaged in the analysis of plain, undecorated ceramics and that much Hellenistic plain ware remain unpublished (p. vii). Notably, much of the material reported was excavated from closed archaeological contexts such as wells, allowing her to not only develop a typology of the ceramics based on fabrics and vessels shapes, but also to develop a more precise relative chronology. This trilogy completes Rotroff's magnum opus which she considers to be the "preliminary publication" of the Hellenistic ceramics from the Agora (p. vii); nonetheless, it provides scholars the most comprehensive assessment yet available of the pottery used by Athenians from the later 4th to 1st century BCE.

The book has four main parts and is accompanied by four appendices, four concordances, a 687-item bibliography, and a variety of illustrative material including five maps, 36 charts, and 17 text illustrations, 98 figures, seven additional figures in the appendices, 90 plates, and 23 tables. In addition, there are three separate, useful indices: "General Index, "Deposit Index," and "Greek Index." In her "Preface," the author thanks a number of friends and scholars (notably Kathleen Lynch) who assisted with analysis and she also acknowledges indebtedness to Andrea Berlin for her publication of the plain ceramics of Tel Anafa, a small settlement located in the Upper Galilee in Israel with major Hellenistic occupation, ca. 125 to 80 BCE. Rotroff borrowed and adapted Berlin's scheme for the analysis and presentation of the Agora materials, e.g. Andrea Berlin's *Tel Anafa II.1: The Hellenistic and Roman Pottery: The Plain Wares* (Kelsey Museum of the University of Michigan/ Museum of Art and Archaeology of the University of Missouri-Columbia Fieldwork Series), *Journal of Roman Archaeology* Supplementary Series 10, Part II, i, 1997. Notably, Rotroff reviewed this publication (which also contains *The Fine Wares*, written by Kathleen Warner Slane) in *Bryn Mawr Classic Review* in 1999, viz. http://ccat.sas.upenn.edu/bmcr/1999_orig/1999-02-14.html.

Of interest to readers of this column, traditional binocular microscopy and thin section petrographic studies were undertaken, the latter by James Stoltman (University of Wisconsin at Madison), and Raman laser microprobe spectroscopy prepared by Brigitte Wopenka and Jill Pasteris (Department of Earth and Planetary Studies, Washington University), while two sets of Instrumental Neutron Activation Analysis (INAA) were conducted by Hector Neff and Michael D. Glascock (Missouri Research Reactor [MURR], University of Missouri at Columbia). Rotroff does not note that Neff moved from MURR to California State University at Long Beach in 2002, where he continues chemistry-based provenance determination in archaeology.

In "Part I: General Overview," Rotroff provides traditional introductory material on the scope and aims of the project, discusses the sample sizes and the relationship between deposit sample, inventory and catalogue. She studied 1,400 inventoried vessels and uninventoried materials from 37 of more than 200 dated Hellenistic deposits. She also defines the pottery fabrics (six local, 12 imported, and one undetermined) and notes relevant INAA and petrographic analyses. Eleven "Household Fabrics" and eight "Cooking Fabrics" are defined and related to vessel forms. Lastly, Rotroff has prepared a splendid descriptive overview of manufacturing techniques, vessel functions, relationships between local and imported materials, and general observations. In the analysis of vessel shapes, Rotroff provides catalogue-like entries including the number of inventories samples, a thumbnail description of the form, range of size, description of decoration (if present), range of date, comparanda, and a discussion of the form, evidence for chronology, function, external connections, manufacturing techniques, etc. (p. 12).

"Part II: Shape Studies" has three major components, the first of which, "Household Ware" (65 pp.), includes detailed descriptions of 15 categories: 14 forms of jugs, seven major amphorae shapes (plus an other category), two types of funnels (and an other category), six forms of vessels for long-term storage (bins, pithos lids and miniature pithos[?]), three kinds of mortars, one serving dish (eschara), one "standard form" krater (plus other forms), four major forms of lekanai (and others), three bowl forms (deep, shall, and small), three basin forms (heavy, shallow spouted, and deep spouted), three types of lids, two stands, a category entitled "other household ware vessels," "standard form" and other beehives, and potter's equipment (the potter's wheel and kiln furniture). The second component, "Vessels for Oil and Unguents" (30 pp.), focuses on "small shapes" (mostly blister ware), including aryballos, fusiform unguentaria, and six other kinds oil and unguent containers. The major category of "Cooking Ware" (75 pp.) concerns 13 types of chytrai (deep, often globular pots); five lopades (normally used for cooking fish) plus four minor

groupings); pans and parchers (shallow cooking vessels) including one parcher, seven forms of pans and two other pan groups); six major lid forms (and seven other groupings); braziers and cooking stands (three major types); and other cooking equipment (steamers, possible stands, and other vessels too fragmentary for definite identification). There is also a very useful section that summarizes diachronic vessel shape chronologies.

In "Part III: Catalogue," Rotroff has organized the 847 entries using the following format: catalogue numbers, reference to illustration, previous publication(s), context (mostly to closed deposits), measurements, state of preservation, description, comparanda and commentary, and date of the context. This section comprises nearly one hundred pages and is a traditional catalogue divided into the same three components as in Part II: "Household Wares," "Vessels for Oil and Unguents," and "Cooking Ware." "Part IV: Deposit Summaries" provides brief descriptions of the physical nature of the deposit, its extent, dimensions, and possible disturbance. Each entry includes information on the official designation of the deposit in the excavation system, the type of deposit (well, cistern, drains, tunnels, fill, etc.), an indication of which fill within a deposit is under discussion, and the estimated date range. The Munsell system for color analysis is not used.

For those of us interested in pottery fabrics, manufacturing processes, and local versus non-local ceramic production, four appendices document technical analyses of ceramic samples. In "Instrumental Neutron Activation Analysis of Ceramics from the Athenian Agora" (pp. 379-391), Hector Neff and Michael D. Glascock analyzed 50 samples of domestic Hellenistic pottery from the Athenian Agora selected and submitted by Rotroff. The sample preparation, irradiation procedures, quantitative analyses of the chemical data and results are reported. They noted a considerable variation in Hellenistic coarse ware fabrics in contrast to fine wares and suggest that the former came from multiple sources. Their analysis shows six distinct compositional groups: three high calcium groups contain three varieties of household ceramics and three low-calcium groups containing different cooking fabrics; only one (Lopas 5 cooking fabric) was contributed to non-Attic sources. Neff and Glascock also contributed a second study, "Instrumental Neutron Activation Analysis of Unguentaria and Attic Fine Ware from the Athenian Agora" (pp. 393-399), an assessment of 43 specimens. The results indicate considerable heterogeneity, and fine wares and unguentaria, like coarse wares (Appendix A), also fall into several compositional groups. Unguentaria fell into to distinct groups, while all but one of 17 Attic fine ware specimens clustered into a single compositional group. The authors also note only one similarity to a compositional group (Attic A) previous defined in a study undertaken at Brookhaven National Laboratory (D. Fillieres, G. Harbottle, and E. V. Sayre, "Neutron activation study of figurines, pottery, and workshop materials from the Athenian Agora, Greece," *Journal of Field Archaeology* 10:55-69, 1983). Both of INAA studies conducted at MURR were partially funded by the National Science Foundation.

"Raman Laser and Microprobe Spectroscopy" (pp. 401-403) by Brigitte Wopenka, Rachael S. Popelka, Jill D. Pasteris, and Susan I. Rotroff concerns the RLM analysis of only four specimens: one each of Hellenistic water-jug fabric 1, Pink temper fabric 1, Micaceous cooking fabric, and Schist cooking fabric. This study shows the limitations of the macroscopic examination of inclusions, and that the Pink temper fabric and the Schist cooking fabric contained similar minerals with the exception of small amounts of apatite in the latter. The fourth appendix, "Petrographic Analysis" (pp. 405-407), reports the quantitative analysis of 13 specimens by James Stoltman. The specimens included five of Pink temper (Groups 1 and 2), four of schist cooking fabric, and one each of Pinkish buff fabric 1, Cooking fabric 3, Micaceous cooking fabric, and Lopas 5 cooking fabric. The procedure is described in general terms, but Rotroff writes that "interestingly, Stoltman's analysis sorts the samples into different groupings from those suggested by macroscopic observation" (p. 405). The cooking wares were distinguished on the basis of the basis of percentage of temper, and Rotroff notes, "thus, like the neutron activation study, these results show that there are differences within Agora cooking fabrics that are not macroscopically apparent. The significance of the differences, however, remains uncertain, and they do not correlate with other variables, such as vessel shape or date, nor do they correlate to the chemical differences revealed by the neutron activation study…" (p. 405). Given the size of the corpus of whole vessels and potsherds obtained from closed deposits that were studied, the numbers of specimens analyzed by INAA are barely adequate to quantify variations among these ceramics. The RLM study and, especially thin-section petrography – four and 13 specimens, respectively – are inadequate to discern variations in this huge corpus; indeed, several hundred thin section studies would barely be adequate. Hence, the statement that she makes about the lack of correlation between binocular microscopy versus the petrographic and INAA studies (p. 405) isn't surprising. The volume also contains "Concordances" which include the Agora excavation inventory numbers, coins, Knidian Type (KT) numbers, and the MURR (Missouri University Research Reactor) sample numbers and the Agora sample numbers.

The 30 years of analysis that Rotroff has devoted to the study of Athenian Agora Hellenistic ceramics has resulted three landmark publications that document mold made bowls, Athenian and imported wheel made culinary wares, and the so-called plain wares, consisting of household ceramics, cooking wares, and containers for oils and unguents. This most recent publication is a testament to a devotion detail and perseverance in completing an arduous task. Archaeologists who deal with quantities of potsherds – especially undecorated or plain wares — can appreciate Susan Rotroff's dedication coupled with knowledge of the literature and comparative materials, as well as intellectual insight. She summarizes that "one impression that emerges from this study is the uniqueness of the Athenian plain-ware assemblage" (p.64). This final volume in the trilogy is unique and will serve as a benchmark for future analyses and will, like its predecessors, become a basic reference work for Hellenistic ceramics.

Malcolm H. Wiener, J. L. Warner, J. Polonsky, and E. E. Hayes (eds.), *Pottery and Society: The Impact of Recent Studies in Minoan* Potter, Gold Medal Colloquium in Honor of Philip P. Betancourt, 104th Annual Meeting of the Archaeological Institute of America, New Orleans, LA, 5 January 2003; Boston: Archaeological Institute of America in cooperation with the Institute for Aegean Prehistory, 157 pp., ISBN 1-931909-14-8, $45.00. This festschrift honors a unique teacher, academic, and author who is also regarded as a specialist in ancient ceramics from the eastern Mediterranean, and who has worked extensively with early Greek architecture. Philip Betancourt is a highly regarded expert on the archaeology of Minoan Crete and an established scholar well-known to archaeologists, art historians, and Classicists who work in the Mediterranean region. He received his doctorate from the University of Pennsylvania in 1970 and an honorary Ph.D. from the University of Athens in 2000. Betancourt is Laura H. Carnell Professor of Art History and Archaeology, Tyler School of Art, at Philadelphia's Temple University, where he has taught since 1970 and has been department chair for 19 years. He teaches both in the department's undergraduate and graduate programs and in the university's Core Program, serves as Adjunct Professor of the History of Art at the University of Pennsylvania, and is a member of the Interdisciplinary Graduate Group in Art and Archaeology of the Mediterranean World (AAMW) at Penn. In addition, he is also the Executive Director of the Institute for Aegean Prehistory (INSTAP), established as a non-profit organization in the United States in 1982 to make grants to promote knowledge of the Aegean region, and to support archaeological fieldwork and research in that region. In 2001 the INSTAP Academic Press began to publish in English primary source material from archaeological excavations as well as individual studies dealing with material from the Paleolithic through the first Olympiad. More than a dozen and a half Prehistory Monographs have been published to date. He planned and subsequently oversaw the construction and operation of the American research center in eastern Crete (the INSTAP Study Center), a facility that annually accommodates more than one hundred scholars and students.

Betancourt has been active in the field, and directed a number of expeditions to Crete to excavate sites such as Pseira, a Bronze Age seaport, Chrysokamino, the earliest copper smelting workshop known from Crete, and the Hagios Charalambos Cave, a burial cave in the upland Lasithi Plain. A current collaborative project is with the Director of the Ephorate for Eastern Crete, Vili Apostolakou, to investigate the seaport of Havania, a coastal settlement north of the city of Hagios Nikolaos. In addition, Betancourt is the author of more than 20 books or monographs and over a hundred articles on Bronze Age Aegean art and archaeology. Among his major works are *The Aeolic Style in Architecture* (1977), *The History of Minoan Pottery* (English edition 1985; Greek translation 1993) – the standard work — and a number of monographs resulting from his excavations. The latter include *Pseira* (Volumes I to IX), Kommos, a large town site in southern Crete (*Kommos* Volume II, 1974), and *Chrysokamino: The Metallurgy Site and Its Territory* (2006). Two new monographs by Betancourt have been published since this volume was issued: Philip P. Betancourt, Costis Davaras, and Richard Hope Simpson (eds.), *Pseira IX: The Pseira Island Survey, Part 2: The Intensive Surface Survey*, Prehistory Monographs 12, Philadelphia: INSTAP Academic Press, 2005; and Philip P. Betancourt, *The Chrysokamino Metallurgy Workshop and Site and Its Territory* in *Hesperia* Supplement 36, Princeton: American School of Classical Studies at Athens, 2006.

This corpus of scholarship and signal contributions to the study of Mediterranean prehistory rightfully earned Philip O. Betancourt the Gold Medal for Distinguished Archaeological Achievement, the Archaeological Institute of America's most prestigious award which reflects a lifetime of distinguished archaeological achievement. The award honors outstanding fieldwork, publications, or teaching, but Betancourt, clearly excels in all three.

The festschrift contains eight essays, in the main, in chronological order, each with separate footnotes and references cited. The "Preface" (pp. ix-x) by James D. Muhly, Professor Emeritus of Ancient History in the Department of Near Eastern Languages and Civilizations at the University of Pennsylvania, and former Director of the American School of Classical Studies in Athens, contains background information on Phil Betancourt as an author, editor, publisher, field archaeologist, and teacher. Muhly was the organizer of the Gold Medal Colloquium and noted that the papers published in this volume are expanded versions of the oral presentations made on January 5, 2003, at the AIA's annual meeting held that year in New Orleans. The next set of contributions were prepared by the volume's Editor-in-Chief, Malcolm H. Wiener, a Harvard-educated attorney who serves as President of the Board of Trustees of the Institute for Aegean Prehistory, is a Trustee of and Member of the Executive Committee of The American School of Classical Studies in Athens, and is an Honorary Fellow for Life of the Archaeological Institute of America. He is also a member of the Council on Foreign Relations, and the Advisory Board of The Malcolm Wiener Center for Social Policy, The John F. Kennedy School of Government, Harvard University, and a Trustee of the Metropolitan Museum of Art. Wiener's contributions included a brief biographical sketch of the honoree, "Philip P. Betancourt: Biography" (pp. xi-xii) which is accompanied by "Philip P. Betancourt: Selected Bibliography" (pp. xiii-xxii). The bibliography differentiates "Books" (23 published from 1977 to 2005), "Articles" (113 published between 1965 and 2005), and "Book Reviews" (14 dating from 1971 to 1996).

Wiener also served at the discussant for the Gold Medal Colloquium and his essay "Pots and Polities" (pp.1-21, 82 footnotes, 100 works cited) contains remarks, comments, and clarifications on the five papers which follow. He provided a two-paragraph background to Minoan pottery before launching into critiques of the papers; some of these comments are up to seven pages in length while others consist of a paragraph. Placing the critiques at the ends of the individual essays would not likely suffice (primarily due to due to citation issues), but,

alternatively, Wiener's full essay might have be placed after the five essays in the same order in which the oral presentations were made. In my review of these five essays, I have noted the paginations for the discussant's remarks and include salient points made by the discussant at the end of each of the chapters.

The initial essay by Peter M. Day, Maria Relaki, and Edward W. Faber is entitled "Pottery Making and Social Reproduction in the Bronze Age Mesara" (pp. 22-72, 166 footnotes, 134 works cited, 19 illustrations [13 in color]); Wiener's comments, pp.1-7. Day received his doctorate from Cambridge University, where his dissertation was *A Petrographic Approach to the Study of Pottery in Neopalatial East Crete* (1991); he has taught at the University of Sheffield since 1994. Relaki holds a doctorate from Sheffield and currently has a post-doctoral there. Her dissertation was *Social Arenas in Minoan Crete: A Regional History of the Mesara from the Final Neolithic to the End of the Protopalacial Period* (2003). Faber submitted a thesis to the University of Sheffield entitled *Middle Minoan Polychrome Pottery: An Integrated Microstructural, Geochemical and Mineralogical of Its Production Technology and Provenance* (accepted 2006). The authors begin their 51-page essay with a discussion of academic traditions versus ceramic traditions, characterizing methods of interpretation and discussing the contributions of scientific methods in ceramic analysis and contemporary perspectives, with Protopalatial period Kamares Ware as a case study. This ceramic is a hallmark of the Middle Minoan period and the authors document chronological issues, provincial versus palatial varieties of the ware, reevaluation of craft specialization and the results of petrographic analyses (following P. M. Day and D. E. Wilson's "Consuming Power: Kamares Ware in Protopalatial Knossos," *Antiquity* 72:350-358, 1998).

Mesara Polychrome is considered as the primary case study; pottery functions and skeuomorphic forms (ceramic imitation of vessels of metal and other precious materials) were reviewed. Analytical approaches occupy a significant portion of the text and documents raw materials and ceramic recipes (clay matrices, sand inclusions, etc.) and a diachronic assessment of sand-tempered fabrics (24 thin section microphotographs detail the variants, Figs. 7-10). Layering and surface decorations are next documented, the latter including black slip, and red, orange, purple, and white paints (18 specimen images resulting from Scanning Electron Microscopy are included, Figs. 14-18). The methods of the application of the slip, paint, and pigments are reviewed as are firing temperatures. Lastly, the authors discuss the results of their research, detail five implications of the analyses, note diachronic consistencies, and characterize these ceramics as prestige goods and their role as a significant part of the material culture associated with funerary rituals.

Wiener notes that this research raises fundamental questions about the nature and context of Minoan specialized craft production and, therefore, about Minoan society and polities. The available evidence from central Crete "implies the existence of substantial continuing regional or local authorities in the Prepalatial period, capable of maintaining links with ongoing pottery communities" (p. 3). He seems less sure that there were ongoing communities of potters and he reviews the "attached" versus "independent" craft production paradigm, referring to Costin's 1991 paper but not her more recent work on craft specialization, e.g., Cathy L. Costin, "Craft specialization: issues in defining, documenting, and explaining the organization of production" (in M. B. Schiffer (ed.), *Archaeological Method and Theory, Vol. 3*, University of Arizona Press, Tucson, pp. 1-56, 1991); "Craft production and mobilization strategies in the Inka Empire" (in B. Wailes (ed.), *Craft Specialization and Social Evolution: In Memory of V. Gordon Childe*, Philadelphia: University of Pennsylvania Museum, Philadelphia, pp. 211-255, 1996); "Craft production systems" (in G. M. Feinman and T. D. Price (eds.), *Archaeology at the Millennium: A Sourcebook*, New York: Kluwer/Plenum, New York, pp. 273-327, 2001); and 'Craft production" (in H. Maschner and C. Chippindale (eds.), *Handbook of Archaeological Methods*, Walnut Creek, CA: Altamira Press, pp. 1034-1107, 2005). He notes that metal prototypes for the skeuomorphs have not been recovered and cites armor depicted on the Bayeux tapestry and 16th-century Portuguese silver braziers as examples to counter the Day et al. argument.

Aleydis Van de Moortel contributed "A Reexamination of the Pottery from Kamares Cave" (pp. 73-93, 67 footnotes, 43 works cited, 6 illustrations [5 in color]); Wiener's comments, pp. 7-9. The author holds an M.A. and Ph.D. from Bryn Mawr College, where her dissertation was entitled *The Transition from the Protopalatial to the Neopalatial Society in South-Central Crete: A Ceramic Perspective* (1997). She currently professes in the Classics Department at the University of Tennessee. Human occupation at Kamares Cave, located in the Ida Mountain Range of central Crete, and excavated and published in 1913 has been dated to 1900-1700 BCE. Van de Moortel begins by differentiating Kamares Ware from Kamares Cave Pottery and relates five objectives in her analysis of registered and unregistered vases and fragments (n = 3,643) and 13,000 mostly unpainted sherds. The cave chronology extended from MM I-MM IB to MM III, LM IA, LM IB, through LM II-LM III, with the majority of the ceramics dated to MM IB. Post-Bronze Age depositions were rare. The results of the study indicated that storage and transport containers were abundant, but that there was also an unexpectedly large number of pithoi; she also documents changes in the assemblage composition through time, especially in two forms: kylix and rhyton. The author then summarized information about the western Mesara pottery production tradition and ceramics from outside of this tradition. For the latter, there was initially a shift of imports and then a decline in these imports. Van de Moortel also considers the site and its relationship to the Phaiston Palace in a review of the transition from Protopalatial to Neopalatial. A possible cave cult is to be considered. Wiener comments that Kamares Ware isn't limited to palaces and related sanctuaries, but is also found in townhouses in major sites including Phaistos, Hagia Triada, Kommos, and Knossos,

yet has not been recovered from "ordinary inland houses or farmsteads" (p. 8). In Egypt and the Levant, the ware was found in private homes rather than palaces or temples. He also suggested that knowledgeable guides in antiquity led persons through the sacred cave so that fewer lamps were needed and, therefore, these artifacts appear infrequently in the ceramic assemblage.

The third contribution is by Eleni S. Banou and Elini Tsivilika, both with the Greek Archaeological Service. The senior author is a University of Pennsylvania graduate whose dissertation was entitled *Pottery Groups from the West Side of Area A at Pseira, Crete* (1991). This festschrift essay is entitled "Provincial Middle Minoan Pottery: The Case of Pera Galenoi" (pp. 94-118, 51 footnotes, 38 works cited, 39 illustrations [32 in color]); Wiener's comments, one paragraph, pp. 9-10. The site of Pera Galenoi is situated on the north coast of Crete and 22 km west of Knossos, and was excavated during four field seasons (1993, 1995, 1998, and 2001). This contribution presents a preliminary analysis of the ceramic assemblages from two excavated areas: the "L-Shaped Area" and "Building Ä Basement Room." The pottery catalogue for the former includes MM IIA Fine Fabric and at least six wares from MM III: Brownish-red Gritty Fabric (cups, and bowls/saucers), Fine Fabric (cups), Coarse Fabric (cups and juglets), Coarse Buff Fabric (sherds), Coarse Red Fabric (Lamps and cooking trays), and Non-Cretan Fabrics (including a Syrian amphora). The "Building Ä Basement Room" assemblage included MM III-LM IA ceramics: Fine Fabric (decorated vases and jugs), Coarse Ware (conical, shallow, and straight-sided cups; bowl/rhyton; juglets; lamps; kalathos; and bridge-spouted jars). The ceramics from MM III-LM IA revealed Fine Fabric cups and crucible fragments. Perplexing to the authors was the absence of Ripple Ware. The preliminary analysis suggests that the site was established during early MM II period and abandoned following a seismic event, but had contacts with central Crete and had cups similar in styles and shapes to ceramics from northeastern Crete. Weiner offers minimal commentary, but suggested that a massive earthquake which also caused damage elsewhere in central Crete lead to the abandonment of Pera Galenoi.

The essay by Kostandinos S. Christakis is entitled "Traditions and Trends in the Production and Consumption of Storage Containers in Protopalatial and Neopalatial Crete" (pp.119-137, 58 footnotes, 35 works cited, 9 illustrations); Wiener's comments, pp. 10-14. Christakis received his doctorate from the University of Bristol and currently teaches in the Department of Education at the University of Crete. His contribution is a summary of his 2005 monograph, *Cretan Bronze Age Pithoi: Traditions and Trends in the Production and Consumption of Storage Containers in Bronze Age Crete*, which has been reviewed previously in *Bryn Mawr Classical Review*; this volume, in turn, is based in part on his 1999 dissertation. The author begins with a discussion of Mesara-made pithoi and assemblages dated to the Protopalatial period (MM IB-MM IIB) and then turns to a lengthy discussion of the Neopalatial period (MM III-LM IB) when new morphological, stylistic, and functional attributes were introduced. Christakis identified three potting groups at the site of Galatas Pediados and considers in detail the characteristics of local and non-local clays and the adoption of north-central Cretan "potting trends" by local potters in south-central Crete; limited influence from western Cretan potters was seen. He also considered the impact of Knossian palatial workshops on pithos production in central Crete and reviews workshop locations and influences. In his conclusion, the author noted marked differences in morphology, style, and the manufacture of pithoi during the Protopalatial and Neopalatial periods. He writes that a narrow range of interrelated morphological and technological parameters deeply rooted in regional pottery traditions inspired potters' choices (p. 133). The evidence suggested that although the pithoi were the products of a great deal of time and labor, these vessels were fabricated primarily to meet the needs of the elite, but that there was no direct control by a governing elite on the potters' production of these storage containers. Christakis summarized a complex pattern of production, distribution, and consumption of pithoi in what Wiener called a "splendid paper" (p. 10), but warned against facile assumptions. The discussant also noted that morphological and decorative attributes of Cretan pithoi were adopted by potters on Thera and that during the Protopalatial period, a minimum of 100,000 conical cups per year were required, necessitating mass production. Kostandinos S. Christakis, *Cretan Bronze Age Pithoi: Traditions and Trends in the Production and Consumption of Storage Containers in Bronze Age Crete*. Prehistory Monographs 18. Philadelphia: INSTAP Academic Press, 2005. This monograph is derived from his dissertation and has previously been reviewed by Charles C. Kolb in *Bryn Mawr Classical Review* 2007.03.05 http://ccat.sas.upenn.edu/bmcr/2007/2007-03-05.html. His dissertation is *Minoan Pithoi and their Significance for the Household Subsistence Economy of Neopalatial Crete*, Bristol, UK: Bristol University, 1999. He has also published a brief interpretive version of this work: Kostas S. Christakis, "Pithoi and food storage in Neopalatial Crete: A domestic perspective," *World Archaeology* 31(1):1-20 (1999), in the thematic issue *Food Technology in Its Social Context: Production, Processing and Storage*.

The final contribution by Jeremy B. Rutter is "Southwestern Anatolian Pottery from Late Minoan Crete: Evidence for Direct Contacts between Arzawa and Keftiu? (pp.138-153, 37 footnotes, 39 works cited, 13 illustrations [4 in color]); Wiener's comments, pp. 14-16. The author received his doctorate from the University of Pennsylvania and is presently Sherman Fairchild Professor of the Humanities at Dartmouth College, and Professor of Classics. The focus of his essay is the LBA pottery recovered from the Late Minoan harbor town of Kommos where a broad range of off-island ceramic imports appeared in the assemblage but scholars have "no idea" where these were produced; chief among these are "reddish-brown burnished" jar forms (p. 139). Rutter's defined purpose is to describe in detail the imports, suggest where the main ceramic was produced, and briefly explore how and why this pottery may be of considerable significance. He characterizes the fabric

as medium-coarse with inclusions, red or yellowish red in color, and its surface treatments and rim diameters. Significantly, the ware was coil-built and not wheel-thrown but wheel-finished. Comparanda date, in the main, to LM II and LM IIIA, with examples dated to LM IIIB. He concluded that these were terracotta copies of bronze or copper originals and likely products originating in southwestern Anatolia, the area called by the Hittites "Arawa lands," and which served to transport coastal Anatolian products to Minoan ports. Interestingly, the ceramic has not been found at Greek mainland sites and equates to LM II- IIIA2 (ca. 1450-1375 BCE). Wiener regarded this essay as an "important and thought-provoking paper (p. 14), and I agree. The discussant also pointed out that the majority of ceramic imports were from southwestern Anatolia and that prototypes for vessel shape may be found in LM I metal vessels.

The essays in this volume are well-written and appropriately illustrated personal tributes to Phil Betancourt and have been produced by two generations of his students and colleagues, all of whom remarked about his assistance in field research and ceramic analyses. The number of color illustrations and their distribution within the individual chapters undoubtedly added a cost to the volume. Only a few minor typographical errors escaped the editing process — Metal instead of Medal (p. 119) – for example. Rutter employed the Munsell color system in his analysis; other authors might emulate this practice. The essays by Day et al. and Rutter provide important baselines useful to scholars interested in ceramic technology and the scientific analyses of ceramics, but each chapter focuses on significant issues in the ceramic history of Crete and is worthy contributions to this honorific work. As Malcolm Wiener stated, "pottery travels widely in the Old Palace Period" (p. 7) and the analysis of ceramics produced locally or imported into Crete during the Bronze Age as documented in these contributions demonstrates how Betancourt revolutionized the study of Minoan pottery and how his colleagues have lovingly recognized this signal contribution to Mediterranean prehistory and to ceramic studies in general.

Other Ceramic Resources

Michel Bonifay and Jean-Christophe Trègalua (eds.). (2007). *LRCW 2: Late Roman Coarse Wares, Cooking Wares and Amphorae in the Mediterranean: Archaeology and Archaeometry*, 2 vols. British Archaeological Reports, International Series S-1662, British Archaeological Reports, Oxford, England. Also, Xavier Clop Garcia (2007). *Material Prima, Cerámica y Sociedad: La gestión de los recursos minerales para manufacturar cerámicas del 3100 al 1500 ANE en el noreste de la Península Ibérica*. British Archaeological Reports, International Series S-1660, British Archaeological Reports, Oxford, England.

FAMSI Reports on Mesoamerican Ceramics

The Foundation for the Advancement of Mesoamerican Studies, Inc.: Reports on Ceramics: 1994-2007 http://www.famsi.org/reports/index.html . The Foundation (FAMSI) was created in 1993 to foster increased understanding of ancient Mesoamerican cultures and aims to assist and promote qualified scholars who might otherwise be unable to undertake or complete their programs of research and synthesis. Projects in the following disciplines are urged to apply: anthropology, archaeology, art history, epigraphy, ethnography, ethnohistory, linguistics, and related fields. The Granting Department provides funds on an annual basis to support research projects that promise to make significant contributions to the understanding of ancient Mesoamerican cultures. Grant recipients are determined through an annual grant application competition. The purpose of the Foundation Research Grants is to support scholarly works with the potential for significant contributions to the understanding of ancient Mesoamerican cultures and continuities thereof among the indigenous cultures in modern Mesoamerica (México, Belize, Guatemala, Honduras, and El Salvador). The Foundation supports projects in the disciplines of archaeology, art history, epigraphy, linguistics, ethnohistory, ethnography, and sociology. It encourages interdisciplinary projects, especially those that combine disciplines in novel and potentially productive ways. The Foundation Grants are awarded to the most qualified scholars regardless of degree level, although FAMSI favors degree candidates, recent graduates and professionals whose projects have not had extensive financial support. Other qualifications being equal, preference is given to candidates whose projects have the greatest likelihood of reaching new understandings of Mesoamerican cultures.

The following contributions to Mesoamerican ceramic studies are available in English and Spanish texts (unless otherwise noted) on the FAMSI Website: Beaubien, Harriet F. (2002) "Textile-Clay Laminates: A special-use material in ancient Mesoamerica." M. Kathryn Brown (2003) "Ritual Ceramic Use in the Early and Middle Preclassic at the Sites of Blackman Eddy and Cahal Pech, Belize." Cabrera Cortés, M. Oralia (2004) "Craft Production and Socio-Economic Marginality: Living on the Periphery of Teotihuacán, México." Calvin, Inga (1997) "Rollout Photography of Polychrome Pottery from El Salvador." Castanzo, Ronald A. (2003) "Tepeaca Kiln Project." Charlton, Thomas H. (1998) "Urban Influences at Rural Sites: Teotihuacán and it's Near Hinterlands." Danien, Elin C. (2004) "Paintings of Maya Pottery: The Art and Career of M. Louise Baker." Elson, Christina M. (2004) "Aztec Elites and the Post Classic Economy: Instrumental Neutron Activation Analysis (INAA) of Museum Collections from Chiconautla, México." Ensor, Bradley E. (2005) "Late Classic–Epi-Classic Ceramic Chronology at Islas de Los Cerros, Tabasco, México." Goldsmith, Kim C. (1998) "Forgotten Images: A Study of the Ceramic Figurines from Teotihuacán, México." Halperin, Christina T. (2005) "Investigating Classic Maya Ritual Economies: Figurines from Motul de San José, Guatemala." Love, Michael (2000) "The Analysis of Archaeological Materials from El Ujuxte, Guatemala/" Meanwell, Jennifer (1997) "Middle Balsas Project: An Investigation of Pottery Functionality and Chronology." Methner, Brett (1997) "Neutron Activation Analysis on Olmec Pottery: A View from La Venta."

Mezzatesta, Michael P. (1994) "Publication: Painting the Maya Universe: Royal Ceramics of the Classic Period." Milbrath, Susan (2005) "Mayapán's Effigy Censers: Iconography, Context, and External Connections. (currently only in English). Montoya, Janet (1999) "Terracotta Figurines from the Pyramid of the Moon at Teotihuacán, México." Morales, Alfonso (1998) "Portable Incensario Restoration at Palenque, Chiapas." Muñoz, Arturo René (2003) "The Ceramic Sequence of Piedras Negras, Guatemala: Type and Varieties." Muñoz, Arturo René (2001) "Ceramics at Piedras Negras, Guatemala." Neff, Hector (1999) "Production and Distribution of Plumbate Pottery: Evidence from a Provenance Study of the Paste and Slip Clay Used in a Famous Mesoamerican Tradeware." Pérez Galindo, Mónica Alejandra (2004) "Colección Dieseldorff: Corpus de cerámica del Clásico Terminal proveniente de Moldes" (currently available in Español). Pérez de Heredia Puente, Eduardo J. (1998) "Chen K'u: La Cerámica del Cenote Sagrado de Chichén Itzá, Estudio de los Fragmentos Cerámicos de las Exploraciones de los Años Sesentas." Pérez Rodríguez, Verónica (1999) "Specialized Craft Production and Social Complexity in Formative Mixteca Alta." Pinkston, Cynthia N. (1999) "Tracing Louis H. Ayme's Explorations in Oaxaca, México, 1884-1885." Powis, Terry (2000) "The Preclassic Whole Vessels of Lamanai, Belize: A Final Report." San Román Martín, Maria Elena (2003) "The Palenque Ceramics: Activities Report, First Phase" (Interim Report). Scott, Sue (2004) "Publication: The Terracotta Figurines from Sigvald Linné's Excavations at Teotihuacán, México." Sullivan, Kristin (2004) "Making and Manipulating Ritual in the City of the Gods: Figurine Production and Use at Teotihuacán, México."

In addition, one thesis on ceramics is available online: Werness, Maline Diane (2003). *Pabellon Molded-Carved Ceramics: A Consideration in Light of the Terminal Classic Collapse of Classic Maya Civilization*. Unpublished M.A. thesis. University of Texas at Austin. Foundation for the Advancement of Mesoamerican Studies, Inc., Crystal River, FL. (95 pp + 421 color images) http://www.famsi.org/research/werness/index.html.

Previous Meetings

The Fourth Forbes Symposium at the Freer Gallery of Art: Studies of Historic Asian Ceramics using Scientific Methods was held in the Agnes E. Meyer Auditorium, Freer Gallery of Art, Washington, DC, 27-29 September 2007. There were four sessions: 1) Technology and Provenance (moderated by Charles C. Kolb); 2) Stoneware and Porcelain (moderated by Pamela Vandiver); 3) Han, Tang and Contemporary Ceramics (moderated by Norman Weiss), and Production and Distribution (moderated by Louise Cort). Five or six papers were scheduled for each session, but one presentation in the Technology and Provenance session was not given. I shall summarize briefly content of the 22 papers that were presented; there were no paper abstracts distributed.

"Scientific Analysis of Glazed Tile from the Seljuk Palace of Kubad Abad, Lake Beysehir, Turkey" by Ian C. Freestone, Zehra Yegingil, and Rüçhan Arik. Freestone discussed the ceramic decorative patterns at the Great Seljuk Palace and presented analyses on the stoneware based on SEM and a study of the glazed tiles via ICP-MS, There were some kilns located on site that produced tiles with low iron content; different rooms in the palace had different tiles produced in a number of loci. Some recipes could be discerned. "Technical Research on the Huge Glazed Bricks from the Relic of Chinese Nanyue Kingdom Palace" by Juan Wu, Jiazhi Li, Rui Wu, Haisheng Wang, Xiaoke Lu, and Junming Wu. This contribution was not presented. "Analysis and Comparative Study of Ceramics from Pyu Ancient Cities in Myanmar" by U Nyunt Han. Mr. Han modified the title slightly and presented information on historic ceramics of the 4th-5th centuries to the 9th and 10th centuries from three urban centers excavated since 1957. Domestic-produced cremation urns with reburied secondary interments were studied and six types were reported; some had designs and scripts derived from south India and showed similarities to stone beads and terracottas from that area. Urn lids with stamped decoration were in the shape of Buddhist stupas. Ten types of domestic ceramics were briefly considered; similarities with south Indian designs and Thai Rouletted pottery were discerned. "Comparative Study on Blue Pigment of Chinese Blue and White Porcelain and Islamic Glazed Pottery 12th-17th Century" by Rui Wen and A. M. Pollard;. Mr. Wen discussed the history of Blue-and-White pottery during the Tang Dynasty, 618-907 CE and relationships with Iznik-produced Islamic glazed wares of the 9th-15th centuries. Compositional analyses of 25 specimens analyzed by XRF were reported and five glaze types noted. He considered a 1637 CE Sung reference work on cobalt ore selection and noted that folk kiln potters used copper and nickel cobalt ores, Islamic wares were fired to 853º C while Chinese Blue-and-white attained firing temperatures of 1200º C. The final paper in this session was "Analysis of Islamic Enameled Ware with a Focus on Minai Ware" by Kerith Koss, Blythe McCarthy, Ellen Chase, and Dylan Smith. Ms. Koss discussed Minai overglaze, seven-color ceramics, and the study of 25 signed and dated specimens from the Metropolitan Museum of Art (1184-1283 CE). The analyses involved XRF and EDS and the authors were able to discern the order of 15 distinct glaze applications,, the differentiation of four different "blues," and the use of iron as a flux to lower glaze temperatures.

The Stoneware and Porcelain papers began with "A Scientific Study on Koryo Celadon and Whiteware from the Kiln Complex at Bangsan Village in Kyonggi Province, Korea" by Carolyn K. Koh Choo. The author discussed celadon from 918-1392 CE, 18 kiln sites (coastal and interior), the production of tea bowls and ewers, and macroscopic analysis and XRF studies of ceramic bodies. One kiln was repaired 7-8 times and the firing opening changed four times. Principal Component Analyses were undertaken and reported. "The Provenance for Chinese Ancient Protoceladon" by Changsui Wang. Kaolin clays from north China and porcelain clays from south china were discussed fro the Shang and Zhou periods. Protoceladon has been identified with north China. The author reported briefly the results of 69 analyses of celadon by INAA.

"Microstructures of Green-Glazed Porcelains from Ru Guan Kiln and Laohudong Guan Kiln" by Weidong Li, Hongjie Luo, and Jiazhi Li. The senior author discussed the nature and chronologies of the two kilns – 940-1126 CE and 1127-1279 CE and a variety of studies undertaken using ED-XRF, SEM, EDS, FESEN, and TEM. Crystallization phases were discerned and phase separation behaviors reported and the resulting color variations in green glaze reported. "Scientific Study of Porcelain from the Lingwu Kiln of Xixia Dynasty in Ningxia, China" by Yan Song and Qinglin Ma. In this very significant paper, Yan Song reviewed the Xixia Dynasty (1038-1227 CE) and what little is know about porcelain production at the time; one kiln has been excavated and ceramics studied by ED-XRF, PLM, and SEM-EDS. Both fine and coarse porcelains were fabricated and white, celadon, and black glazed were used. Firing temperature attained 1100-1150 and even 1200º C. "Study on the Technological Innovation of Ancient White Porcelain" by Tiequan Zhu Zhenwei Mao, Zhengquan Yao, Weibin Pan, and Bin Xus. The research presented focused on understanding the kiln process and recipes, discerning chemical composition, and conducting firing experiments Data on three kilns was presented and analyses done by ED-XRF, INAA, WD-XRF, and XRD reported. Types of kaolin were documented and changes over time in the same kiln were a notable result of the studies. "Research on the Question of Dating Chinese Famille Noire Porcelain" by Linda Rosenfeld Pomper, Jeffrey P. Stamen, and Norman R. Weiss. Pomper and Weiss co-presented the paper; she provided an historical and archival context for the ceramic which she had studied in seven museum collections; because of its desirability in European society "it was worth faking." Complete specimens from the Frick Collection were analyzed (XRD of the surface chemistry).

The next group of presentations began with "Production Process and Techniques: Pottery Buildings of Han Dynasty China (206 BC - AD 220)" by Qinghua Guo; the published title was changed to " Production Methods and techniques: Mingqi Pottery Buildings of Han Dynasty China (206 BCE-220 CE)." Previous research on building methods and typology were reported and a new detailed examination of the buildings and tools of production were documented. Characteristics include compartment assembly, a "frontality" emphasis (backs were left plain), the use of miniature roof tiles, the luting of clay slabs, the use of molds and decoration. Some structures were seven-stories high (watchtowers); other structures included granaries and pig sties. Decoration was a specialized craft (carving, painting, glazing, etc.) and some have master potter's names on "signed" pieces. These were locally made from local clays and used in tombs by the wealthy. "The Spread of Pottery Miniatures of Domestic Structures in China" by Yoshio Kawamura. The author considered three regions (east, west, and south) and discussed the typical kinds of miniatures (cooking stoves [13 types], granaries-storehouses [9 shapes] , and wells [11 shapes]), and their distributions in Han territory through seven phases. The types and methods of manufacture were compared and contrasted. "Characteristics of Tri-colored Earthenware from the Huangye Kiln Site" by Junko Furihata and Junitiro Tatsumi. Three previous studies were reviewed, including analyses by CD-XRD, XRF, and XRD. Ms. Furihata's study of 26 specimens involved binocular microscopy, CR, XRD, and XRF of early 8th to mid-9th century CE examples. Potters and painters worked closely together to produce these unique wares. The results of the current analysis were contrasted with the earlier studies, and chemical distinctions in Chinese sherd were noted. "Latest Archaeological Discoveries of Tang Sancai in China and Their Provenance Study" by Qian Cheng and Yong Lei. Specimens from three kilns and six tomb sites (all dated, 618-907 CE) were studied by INAA. The Li Hui kiln, 689 CE, yielded 139 large white-bodied figurines; the Zhang Huai kiln, 706 CE, had 230 red-bodied figures, some up to 1.0 m in stature; and the Jei Min kiln, 710 CE, had 15 white-bodied figurines 1.0 m tall. Ceramic wares were produced earlier than the figurines in each case. "Influence and Imitation of 9th and 10th Century's Ceramics between Mesopotamia and China" by Tatsuo Sasaki. This interesting paper concerned Tang Chinese porcelain bowls made in northern China that were exported to western Asia; Islamic copies appeared in the late 9th century, and were recovered at Samarra, Iraq. Fabric analyses were undertaken on 16 samples using "polarized microscopy" and INAA. Some specimens of celadon and large jars were also exported to the west. Abbasid and Chinese products were compared and problems in analyzing yellow-glazed wares were reported.

"Defining A New Type of Japanese 'Folk' Ceramic: Nishi Sarayama Ware" by Andrew L. Maske. The author gave a brief historical overview of the Edo period and three areas of pottery production. Specimens of utilitarian pottery; kiln furniture, sherds, and kiln wall fragments were recovered in 1992; SEM results were noted and changes in clays during the 150 years of production were observed as were changes in taka marks, "The Impact of Imitation Celadon and Porcelain Industries on Chinese Ceramic Exports in the Indian Ocean Maritime Exchange, ca. 1200-1700 CE" by Rahul Oka, Laure Dussubieux, Chapurukha M. Kusimba, and Vishwas D. Gogte. The Chinese ceramic export economy of "big men" and "small traders" was detailed for the period 800-1200 CE by Mr. Oka and provenience studies reported (LA-ICP-MS) for celadon and Blue-and-White from East Africa and the west coast of India. Chinese celadon and porcelain dominated the assemblages at the two sites reported. The problems of imitation and heirloom status were considered as was the issue of informal economies, Chinese competition with Arab and South Asian traders was also documented. "Beyond the China Sea: Characterizing Asian Stoneware Production at the Transition to the Early Modern Period (1550-1650 AD)" by Peter Grave. Grave discussed stoneware jar production and geochemical analyses via INAA and SEM. Seventeen compositional groups were determined from the analysis of 964 stoneware jar specimens from Portuguese, Spanish, and Dutch shipwrecks; the pottery was fabricated in a variety of loci: Burma, Thailand, Vietnam, and South China. European impact on the production of stoneware in Southeast Asia was minimal. "New Data on the Distribution of Khmer Ceramics Kilns" by Darith Eapsara. Four kiln sites areas dating 9th-15th century located on or near royal roads in Angkor, Siem Reap province were documented. Green

glazed ware was earliest and unglazed stoneware roof tiles were made. Radiography and microprobe analyses were noted and green and brown glazes differentiated. "The Preliminary Stage of the Anlong Thom Kiln Excavation on Kulen Hill in Angkor" by Visoth Chhay. The kiln, known in the French literature since 1888, produced 40 vessel forms. Excavations in 2006 indicated a cross-draft structure with roof tile supports and no evidence of kiln furniture. Architectural wares were fired in the read of the kiln and household vessels were placed in the front of the chamber. Types of clays, vessel decoration, and manufacturing techniques were documented. The final paper was "Re-thinking Khmer Ceramics through Inscriptions and Bas-reliefs" by Keo Sovannara Sok. Khmer and Sanskrit words and their chronologies as represented on pottery and relief were discussed based on the analysis of 1,300 inscriptions. This linguistic analysis included 37 comparisons.

The Forbes Symposium at the Freer Gallery of Art varies topically but the fourth was devoted entirely to ceramics. The previous publications include: Paul Jett (ed.) with Janet G. Douglas, Blythe McCarthy, and John Winter (2003) *Scientific Research on the Field of Asian Art: Proceedings of the First Forbes Symposium at the Freer Gallery of Art*. London: Archetype Publications in association with the Freer Gallery of Art, Smithsonian Institution; Paul Jett, John Winter, and Blythe McCarthy (eds.) (2005) *Scientific Research on the Pictorial Arts of Asia: Proceedings of the Second Forbes Symposium at the Freer Gallery of Art*. London: Archetype Publications in association with the Freer Gallery of Art, Smithsonian Institution; and Janet G. Douglas, Paul Jett, and John Winter (eds.) (2007). *Scientific Research on the Sculptural Arts of Asia: Proceedings of the Third Forbes Symposium at the Freer Gallery of Art*. London: Archetype Publications in association with the Freer Gallery of Art, Smithsonian Institution. The publication of the ceramic papers will likely be in late 2009.

Taking Shape: Ceramics in Southeast Asia was the title of a lecture given at the Freer Gallery in Washington, DC on 13 October 2007 by Freer Curator of Ceramics Louise Cort and anthropologist Leedom Lefferts. Cort and Lefferts have been conducting ethnographic and ethnoarchaeological on pottery makers in mainland Southeast Asia for nearly two decades. They discussed contemporary village-based ceramics production in Cambodia, Laos, Malaysia, Thailand and Vietnam in light of traditional craft production a in an age of industrialization and shifting market forces. Their lecture complements "Taking Shape: Ceramics in Southeast Asia" an exhibit in the Sackler Gallery curated by Cort.

The Eastern States Archaeological Federation 74th annual meeting was held in Burlington, Vermont, 8-10 November 2007. Seven papers on archaeological ceramics were presented: "Instrumental Neutron Activation Analysis of Middle Woodland Pottery from the Delaware Valley" by George L. Pevarnik (Temple University), Matthew T. Boulanger, and Michael D. Glascock (both, University of Missouri at Columbia); "Building Tools for Identifying Local Variability and Cultural Patterns: A Digital Ceramic Attribute Analysis" by Angela Labrador (University of Massachusetts at Amherst); "Moving Beyond the Reduction Stage in Debitage Analysis, with a Little Help from the Pot Sherd" by Niels R. Reinhart (University of Massachusetts at Amherst); "Preliminary Results of an ICP-MS Analysis of Abbott Zoned Incised Ceramics from Virginia and New Jersey" by Laura Steadman and Martin D. Gallivan (College of William and Mary); "Artisan Choices and Technology in Native American Pottery Production" R. Michael Stewart and George Pevarnik (both Temple University); "Ceramic Analysis of the Pethick Site" [Schoharie County, New York] by Christina Rieth (New York State Museum); and "XRF Analysis of the Lithic and Ceramic Artifacts from the Pethick Site" (Candis Wood (University of Albany, SUNY), Christina Reith (New York State Museum), and Sean Rafferty (University of Albany, SUNY).

The Materials Research Society met in Boston, MA, 26-30 November 2007 and included Symposium Y: Materials Issues in Art and Archaeology VIII was chaired by Pamela Vandiver (University of Arizona), Francesca Casadio (The Art Institute of Chicago), Blythe McCartney (Smithsonian Institution), Robert Tykot (University of South Florida), and Jose Luis Ruvalcaba Sil (Universidad Nacional Autónoma de México) held 26-28 November. Thirty-eight papers were presented in Symposium Y, including three on ceramics (all presented on 28 November): "Prehistoric Ceramics of Northern Afghanistan: Neolithic through the Iron Age" by Charles C. Kolb (National Endowment for the Humanities, Washington, DC); "Analysis of Modern and Ancient Artifacts for the Presence of Corn Beer: Dynamic Headspace Testing of Pottery Sherds from Mexico and New Mexico" by Ted Borek and Michael Keenan (both Sandia National Laboratories, Albuquerque, NM) and Glenna Dean (Archaeobotanical Services, Inc., Abiquiu, NM); and "Characterization of Coral Red Slips on Greek Attic Pottery" by Marc Sebastian Walton, Karen Trentelman, Eric Doehne, Giacomo Chiari, and Jeffrey Maish (all Getty Conservation Institute, Los Angeles, CA), and Alex Buxbaum (FEI Company, Hillsboro, OR).

Forthcoming Meeting

The Clay Minerals Society's (CMS) 45th Annual Meeting will be held 5-10 April 2008 in New Orleans, Louisiana in conjunction with the national meeting of the American Chemical Society (ACS). Under the ACS umbrella, a full CMS program will be held, as always, but will also provide CMS members with an opportunity to interact with the ACS membership. Conversely, ACS members will be able to attend CMS sessions. The CMS is planning to include a symposium devoted to Geoarchaeology this meeting; the call for abstracts ended on 28 October 2007. Contact Brenda Ross, Assistant Dean of the Faculty and Professor of Chemistry, Cottey College, 1000 W. Austin, Nevada, MO 64772, telephone 417/667-6333 x 2215 or email at bross@cottey.edu for specific information. Information about the meeting may be found at the meeting site, www.cottey.edu/clay; the abstracts Internet site is located at http://oasys.acs.org/acs/235nm/geoc/papers/index.cgi.

Book Reviews

Stacey N. Lengyel, Associate Editor

Caribbean Rum: A Social and Economic History. Frederick H. Smith, University Press of Florida: Gainesville, USA, 2005. xvi + 339 pp., 26 figures, 18 tables, endnotes, bibliographical references, index. Price: US$59.95 (cloth). ISBN: 0-8130-2867-1.

Reviewed by Christina M. Giovas, University of Washington, Department of Anthropology, Denny Hall M32 Box 353100, Seattle, WA 98195, USA

This book is a comprehensive chronicle of rum's development, role and impact from the seventeenth century onward. The author focuses on the Caribbean rum industry, but the social and economic forces he traces take the reader to the Americas, Africa, Europe, Asia, and beyond. Caribbean rum, thus, becomes a microcosm for the process of globalization that began when Columbus arrived in the New World. For this reason, it deserves to be read by students of economic, Atlantic and Caribbean history. Similarly, anthropologists and others interested in slavery, colonialism, post-contact and alcohol studies will find this text compelling. Even the rum connoisseur is likely to appreciate this book which contains many enjoyable details and anecdotes about the spirit.

While the book is a serious, scholarly treatment of rum's history, it is written in an easy, approachable style accessible to a wide audience. Smith documents not only the economic impact of rum, but seeks to elucidate its socially constructed meaning for different Caribbean groups through the course of colonial conflicts, slavery, abolition, demographic shifts, revolution and prohibition. The author argues that rum's social and economic significances flowed from the temporary escape it offered consumers from the hardships of Caribbean life. Smith recognizes the contextual nature of these multiple significances and locates them within a framework of time, place and, most importantly, people. He ably demonstrates how attitudes and practices in relation to rum production and consumption were not uniform across the Caribbean, but instead relied heavily on prevailing belief systems, political currents and economic realities.

An introductory chapter outlines this approach to the subject and provides an overview of the structure and aims of the text. Chapter 2 discusses the emergence of rum and its precursors in the West Indies. Here, the inverse relationship between sugar and rum and its ties to the plantation slavery system are established. Smith does not delve deeply into the mechanics of the Atlantic triangle trade, however, and readers seeking an updated account of this notorious enterprise will need to look elsewhere. Chapter 3 examines the basics of rum production and the competitive threat that the emerging industry posed toward other alcohol producers in the eighteenth century. Smith approaches this topic from the perspective of the Caribbean colonies, showing how economic and territorial maneuvering by European nation states affected the fortunes of West Indian distillers. He does a fine job of linking this to prevailing attitudes toward alcohol, demonstrating how contemporary ideas about the salubrious merits of alcoholic drinks were manipulated by both rum makers and their competitors to justify protectionist legislation.

Smith then looks specifically at rum use by slaves and colonial-era Afro-Caribbeans (Ch. 4). He refrains from vilifying rum for its role in the Atlantic slave trade in favor of examining the social and sacred uses of rum amongst these groups. Considering the lack of slave testimony from which to draw upon, the author's treatment of this topic is quite sophisticated. Smith blends information from period records with historical and ethnographic studies to flesh out the African background for West Indian rum-related practices while managing to avoid the pitfall of lumping together all West and West Central African ethnicities into one homogeneous collective. The central question, whether Caribbean slave drinking practices reflect the direct transfer of particular African ethnic customs or new practices cobbled together from parallel traditions, makes this chapter one of the most compelling of the text. The role of Western rum consumption in helping create and perpetuate the institution of slavery is addressed only peripherally. Readers may judge for themselves whether this is a deficiency. Since the latter topic has been explored extensively, however, I appreciated Smith's fresh and nuanced approach here.

With this backdrop set, Smith explores rum as a form of alcoholic marronage (Ch. 5), a means for creoles, slaves and freedmen to channel the psychic energy of anxiety, physical hardship, power relations and the struggle for identity. The temperance movement as an outgrowth of missionary zeal and new attitudes about alcohol is examined (Ch. 6), followed by an account of the rum industry's economic fortunes during the nineteenth and twentieth centuries (Ch. 7). The book concludes with a brief look at the marketing tactics employed by distillers to sell rum, alcoholism in the Caribbean, and alcohol's place in popular culture. These last topics are not developed in great detail but proved to be so interesting I was left wishing the author had devoted additional discussion to them.

Smith's efforts to integrate information on Island Carib alcohol use is commendable (Ch. 2). I was somewhat disappointed by his discussion here however. The book too readily extends practices attributed to the indigenous occupants of particular islands to all Island Caribs at large and ignores critiques suggesting "the Island Carib" as a self-identifying, contact–period indigenous group may be largely a European construct. Consideration for cultural diversity among the Lesser Antilles' indigenous inhabitants—and by implication, the potential for different attitudes and practices regarding alcohol—is, regrettably, not extended to Island Caribs in the same manner as for Afro-Caribbean peoples. While the paucity of reliable historical and archaeological data on Island Carib identity serves as a limiting factor, some recognition that alcohol-

related practices might have been more complex than suggested by European accounts is warranted here.

Most of the chapters stand on their own as individual expositions making the text appropriate for casual perusal or for use as selected readings in an instructional context. *Caribbean Rum*'s great strength is its integration of documentary, historical, ethnographic and archaeological sources. Smith does an excellent job of interweaving these economic and social historical data to produce a rich and frequently engaging narrative. The incorporation of primary documentation, such as plantation records, is especially informative. At times, the heavy citation of sugar and rum production values for the various plantations and distilleries can come off as a bit dry. However, the author is generally judicious in his use of these, employing them as necessary to make a point or support a conclusion.

Because the text covers so much geopolitical and temporal ground, the inclusion of a graphic timeline chronicling major developments in rum's history would have been helpful for keeping track of how various socio-political events interrelate in their impact on the industry. Otherwise, tables and figures are straightforward and easy to read, and illustrations are well-selected to augment the narrative, although they could at more times have been explicitly discussed in the text. Smith's discussion of the marketing strategies reflected in distillery bottle labels would have been far more compelling had images of these labels been included in the text, but perhaps copyright or advertising regulations prevent this. The index provides comprehensive topical coverage of the book.

Recently, I attended a boat launching celebration on the Caribbean island of Carriacou where rum was poured over the deck as an offering. Witnessing this act, Smith's account was made especially poignant, anchoring the customs of the present to a deep and complex past. Overall, I found *Caribbean Rum* to be well-researched, informative, and engaging. It, undoubtedly, adds a new level of sophistication to our understanding of the socio-economic forces surrounding rum production and consumption in the Caribbean and its meaning to Caribbean peoples.

Upcoming Conferences

Rachel S. Popelka-Filcoff, Associate Editor

2008

3-6 January. American Institute of Archaeology National Meeting, Chicago, IL USA. General information: http://www.archaeological.org/webinfo.php?page=10096.

9-12 January. Society for Historic Archaeology, 2008 Conference on Historical and Underwater Archaeology, Albuquerque, NM, USA. Call for Papers: May 1, 2007 General information: http://www.sha.org.

26-30 March. SAA 73rd Annual Meeting. Vancouver, BC Canada General information: http://www.saa.org/meetings/index.html.

2-6 April. 36th Annual Conference on Computer Applications and Quantitative Methods in Archaeology: "On the Road to Reconstructing the Past" Budapest, Hungary. General information: http://www.caa2008.org.

5-10 April. 45th Annual Meeting of the Clay Materials Society "Clays of Demeter". New Orleans, LA, USA. General information: http://www.cottey.edu/clay, Contact: Brenda Ross, Symposium Organizer: bross@cottey.edu.

6-10 April. 235th National Meeting and Exposition, American Chemical Society, New Orleans, LA, USA. General information: http://www.acs.org.

27 April-1 May. American Association of Museums National Meeting. Denver, CO, USA. General information: http://www.aam-us.org/am/08/index.cfm.

12-16 May. International Symposium on Archaeometry in Siena, Italy. General information: http://www.unisi.it:80/eventi/isa2008.

2-7 June. Clay Minerals Society, Santa Fe, NM USA General information: http://www.sandia.gov/clay, Contact: Eric Blinman, Office of Archaeological Studies, PO Box 2087, Santa Fe, NM 87504-2087, eric.blinman@state.nm.us.

4-8 June. Cod and Herring: The Archaeology and Early History of Intensive Fishing. Westray, Orkney, Scotland. A workshop of the International Council for Archaeozoology, the History of Marine Animal Populations, the Global Fisheries History Network and the McDonald Institute for Archaeological Research Contact: CodHerring2008@mcdonald.cam.ac.uk General information: http://www.mcdonald.cam.ac.uk/CodHerring2008.

29 June-4 July. Sixth World Archaeological Congress. Dublin, Ireland. For more information, visit the website, http://www.ucd.ie/wac-6.

13-18 July. Goldschmidt Conference "From Sea to Sky". Themed sessions. Vancouver, Canada. For more information, visit the website, http://www.goldschmidt2008.org.

4-8 August. Denver X-ray Conference, Colorado Springs, CO USA. For more information, visit the website, http://www.dxcicdd.com.

6-14 August. 33rd International Geological Congress. Oslo, Norway. Sessions on geoarchaeological themes: 1: General contributions to geoarchaeology 2: Geoarchaeology and geomythology as geological constraining tools 3: Geophysical and geochemical archaeology 4: The geoarchaeological perspective: Human interactions with the geosphere, 5: Geology and cultural heritage, and finally, 6: Geoarchaeology and archaeometry. For more information, visit the website, http://www.33igc.org.

17-28 August. 236th National Meeting and Exposition, American Chemical Society, Philadelphia, PA, USA. For more information, visit the website, http://www.acs.org.

23-27 August. Sixth meeting of the Bird Working Group (BWG) of ICAZ (International Council for ArchaeoZoology), Groningen Institute of Archaeology, Rijksuniversiteit Groningen, Netherlands. Themes include the provision of food and raw materials, the use of birds in rituals and symbolism, the impact of human activities on the wild bird fauna, and other topics related with the relation between man and birds. For more information, visit the website, http://www.alexandriaarchive.org/icaz/icazForum/viewtopic.php?t=887.

22-26 September. ICOM (International Council of Museums) Committee for Conservation New Delhi, India. Theme: Diversity in Heritage Conservation: Tradition, Innovation and Participation. For more information, visit the website, http://icom-cc.icom.museum/TriennialMeetings.

5-9 October. Annual Meeting of the Geological Society of America. "Celebrating the International Year of Planet Earth" Houston, Texas, USA. Abstract submission deadline: April 1 2008. Contact information: The Geological Society of America, 3300 Penrose Place; PO Box 9140 Boulder, CO 80301. For more information, visit the website, https://www.acsmeetings.org/2008.

19-23 November. American Anthropological Association Annual Meeting. San Francisco, CA, USA. For more information, visit the website, http://www.aaanet.org/mtgs/mtgs.htm.

19-23 November. Ceramic Ecology XXII (as part of the American Anthropological Association meetings). San Francisco, CA, USA. For more information, visit the website, http://www.aaanet.org/mtgs/mtgs.htm, Contact: Charlie Kolb ckolb@neh.gov.

15-19 December. American Geophysical Union Fall Meeting, San Francisco, California, U.S.A. Contact: AGU Meetings Department, 2000 Florida Avenue NW, Washington, DC 20009 USA; Phone: +1-202-777-7335; Fax: +1-202-328-0566; E-mail: meetinginfo@agu.org; For more information, visit the website, http://www.agu.org/meetings.

Department of Anthropology
University of South Florida
4202 E. Fowler Ave., SOC 107
Tampa FL 33620-8100 USA

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