



SAS Bulletin

Newsletter of the Society of Archaeological Sciences

Volume 33 number 1

Spring 2010

Groundbreaking News

As an anthropologist who works extensively in the Caribbean, I was greatly struck by the suddenness and severity of the earthquake that has ravaged much of southern Haiti. The loss of human life is nearly incomprehensible (with some estimates providing figures of up to 200,000 people dead), and the images of destruction coming out of the nation are reminiscent of war footage. The occasional stories of a rescue of a trapped individual or the reuniting of a parent and child are touching, but they also emphasize how many people were not able to be saved or will never again see their loved ones. We are continually reminded of the power of the earth to dramatically change a life, a nation, or a culture – all with little to no warning.

But as an archaeologist, I should not be too surprised by the influence the ground has on the people living

above it. I have studied the changes caused by temblors in other cities (e.g., Port Royal, Jamaica) and at other times, and can see the effects of ground movement in the stratigraphy at different sites. In the long view, the seismic activity has a deep history and, unfortunately, an inevitable future.

Finally, as a scientist, I realize that we can learn from the same rocks and soil that shake our lives. Even the smallest pieces can provide great information about past behaviors. This issue contains an article on the analysis of obsidian microdebitage. The authors find that, in some situations, the oft-ignored tiny stone artifacts may turn out to be the most accurate indicator of the source of this important material. There are also reviews of new research on the collection and processing of raw clays and how those methods shape pots, as well as PhD theses that investigated the selection of mines for ore and the shifting craft production found in traditional archaeometallurgy. In short, we cannot ignore the ground beneath our feet, for all its benefits and its dangers.

I hope that future *Bulletins* I edit will include more earthshaking research and less commentary on devastation. But my first issue is, at least for me, quite memorable in its timing.

Jay VanderVeen, editor



A startling “before and after” picture of the Presidential Palace in Port-au-Prince (image from telegraph.uk.co).

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Announcements

Michael Gregg will be replacing A.J. Vonarx as the Vice President for Membership Development of the Society. Dr. Gregg is currently at the Museum of Archaeology and Anthropology, University of Pennsylvania, where he works on stable isotope geochemistry. However, Mike was a graphic designer before he became an archaeologist. He served as Art Director at Walter Thompson, a top of the list world-wide marketing agency and a highly competitive position. Such experience led him to be the Executive Art Director of the Globe and Mail of Canada. Michael has already started envisioning how to position ourselves as a leading society, as well as outlining some strategies to attract a wider audience to join SAS. The Society will miss A.J.'s tireless work in this position, but please help welcome Mike when you next see him.

As a result of a collaborative effort with the Society for American Archaeology, SAS will acknowledge an outstanding student poster for its innovative contribution in the use of scientific technologies to archaeological research by granting the R. E. Taylor Award, consisting of US\$100 and a one-year subscription to the SAS Bulletin. (Financial support for the Taylor Award derives from the membership royalties of those who have joined us in our quest of making of archaeological sciences relevant to the study of humankind by using the tools of tomorrow.) This prestigious award is named in honor of Professor Emeritus R. Ervin Taylor of the University of California at Riverside for his outstanding contributions in the development and application of radiocarbon dating in archaeological research and dedication to the founding of the Society for Archaeological Sciences, for his leading role as President (1980) and General Secretary (1981-2002) and his committed service as editor of the SAS Bulletin.

For more than a decade, receiving the R.E. Taylor Award has enhanced the career of those who are now prominent young scholars and professionals. This year, SAS will offer the R. E. Taylor Award at the SAA's 75th Anniversary Meeting in St Louis, MO. Entries will be judged on the significance of the archaeological problem, appropriateness of the methods used, soundness of conclusions, quality of the poster display, and oral presentation of the poster by the student, who should be the first author in order to compete. Students must submit an application via email to Adrian L. Burke (adrian.burke@umontreal.ca) by March 12, 2010 to be considered for this award. Applications in the form of an email message must include the title and abstract of the poster, proof that you have registered for the SAA meetings in St. Louis (email from the SAA), and proof of your status as an undergraduate or graduate student (usually appears on your SAA registration). An email confirmation that your application has been received will be sent to you. Please keep this email confirmation. Students will also submit a .pdf version of their poster on or before April 5, 2010. This will give the judges adequate time to evaluate your posters. Judges will be present in person at the SAA meetings to judge posters and to ask

students questions about their research. Prizes will be awarded at the SAA meetings following the end of the last poster.

Don't forget to regularly check the SAS blog (<http://socarchsci.blogspot.com/>) for interesting stories and thoughts on the use of scientific research in archaeological studies. The blog is moderated by Rob Sternberg, and it also includes links to podcasts, other relevant blogs, and archaeometry news items. SASnet, an electronic network for the Society for Archaeological Sciences, is used by many members to discuss the applications of methods from the physical sciences to archaeological problems and provide rapid communication among archaeometrists and archaeologists. It is intended to provide a resource for archaeologists who need access to technical expertise and a forum for physical scientists to discuss the development of archaeological applications of their methods. SASnet can be joined at SASweb (<http://www.socarchsci.org/index.html>), which is administered by Destiny Crider. Finally, you can access the SAS wiki (<http://sites.google.com/site/saswiki/>) for the latest job postings, upcoming conferences, and other announcements.

The Use of Laser Ablation Inductively Coupled Plasma Mass Spectrometry (LA-ICP-MS) on Obsidian Microdebitage: Case Studies from Chiquiuitan and El Baúl, Guatemala

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Hector Neff, California State University Long Beach

Oswaldo Chinchilla, Universidad Francisco Marroquín

This report summarizes the results of a Laser Ablation Inductively Coupled Plasma Mass Spectrometry (LA-ICP-MS) analysis of obsidian microdebitage from Chiquiuitan and El Baúl, two archaeological sites in the Pacific coastal region of Guatemala. Obsidian microdebitage is sometimes overlooked and frequently under analyzed in archaeological contexts. Its small size and often prolific numbers can be daunting to the lithic analyst. This study tested the efficiency of LA-ICP-MS chemical characterization on small, thin obsidian artifacts recovered at El Baúl and Chiquiuitan. Technically, some of the artifacts used in this study were not microdebitage, according Knut Fladmark's (1982:501) first definition of the term as any production refuse smaller than 1mm in maximum dimension. Nonetheless, this study confirms the efficiency of LA-ICP-MS on very small artifacts, in this case ranging from 3.18 mm – 250 µm. Given the importance of microdebitage in identifying primary contexts for production, our effective sourcing of these artifacts through LA-ICP-MS offers an alternative to other commonly used methods for sourcing obsidian which require a minimum dimension for analysis. Second, our study lends information to the challenging issue of visual sourcing of microdebitage, as the visual characteristics of small, thin artifacts can be very different from larger, thicker ones, and visual identification for microdebitage can at times be impossible. Given the achievements of this study, we argue that the application of LA-ICP-MS provides a new and important

tool with which archaeologists can approach obsidian procurement and production.

LA-ICP-MS

The successful application of LA-ICP-MS to obsidian microdebitage was more recently demonstrated by Ian Fraser-Shapiro and Will Gilstrap (2007) at IIRMES (see also Eerkens et al. for small artifact analyses using other techniques). Their study used LA-ICP-MS to source obsidian materials from five previously analyzed sources in California. Fraser-Shapiro and Gilstrap prepared samples for this study by grinding obsidian and classifying the resulting particles into five different size categories. Fraser-Shapiro and Gilstrap concluded that successful provenance results could be gathered through LA-ICP-MS for obsidian samples as small as 90 μ m. Problems gaining accurate chemical signatures were encountered on samples smaller than that size. While this study proved the capability for sourcing very small particles of obsidian through LA-ICP-MS, its applicability using actual archaeological materials was not tested until the present study.

Methodology

The obsidian used for this analysis came from the sites of Chiquiuitan and El Baúl, located on the Pacific coast of Guatemala, in the departments of Santa Rosa and Escuintla, respectively (see Figure 1). Chiquiuitan is an Early and Middle Formative site located less than one kilometer from the Pacific coast. It was investigated by the Proyecto Arqueológico Chiquiuitan, directed by Molly Morgan and Judith Valle (Morgan and Valle 2006 and 2007).



Figure 1. Map of Mesoamerica showing the location of Chiquiuitan and El Baúl.

These excavations targeted residential contexts in four mounds at Chiquiuitan, especially Mound 13, where horizontal exposures of dirt floors and associated storage pits, middens,

hearths, and burials provided materials that were useful in reconstructing domestic activities. Dirt floors were removed in segments of 0.5 x 0.5 m, with thicknesses of about 3cm, and wet-screened through fine 2 mm mesh to recover tiny remains such as shell fragments, animal bones, fish vertebrae, and obsidian debitage. Of the artifacts analyzed in this study, 38 were very small flakes collected from these dirt floors.

El Baúl is the largest architectural compound at Cotzumalhuapa, a major site on the Pacific piedmont of Guatemala. The site covers over ten square kilometers (see Figure 1). The site is known for its distinctive art style that has been found at distant sites along a 200 km stretch of the coast showing the political and economic influence of the region. Obsidian production was also an important economic activity, especially during the Late Classic Period in Cotzumalhuapa.

Significant surface concentrations of obsidian at El Baúl were noted and test excavated by Sonia Medrano in 1996. Excavations in 2002 by Chinchilla and co-workers revealed dense subsurface obsidian deposits (Chinchilla 2004). The highest concentrations are found at the rock-strewn top of a natural promontory, where a shovel test revealed a maximum density of 40,526 obsidian fragments per cubic meter, recovered by sifting materials through 2 mm mesh.

A stratigraphic pit (Suboperation P31) excavated by the edge of one of these platforms revealed a series of primary deposits of obsidian refuse. Unlike the indistinctly mixed materials recovered in upper excavation strata, these deposits appeared to be the result of specific depositional events, which were sealed relatively quickly by the construction of the platforms above, and thus remained undisturbed. The P31 stratigraphic pit continued below these deposits to a depth of 3.78 m, revealing volcanic ash layers derived from the adjacent Fuego volcano. Obsidian debitage continued below these ash layers, suggesting that the area was used as a refuse deposit for a prolonged period. All 172 artifacts from El Baúl that were tested in this study represent microdebitage collected from a discrete deposit within the P31 stratigraphic pit, EB9-P31-06, which appears to be a single event deposition of obsidian debitage. This deposit contained 14,489 obsidian microartifacts; the sample for this study was randomly chosen from this group and represents a small fraction of the total artifacts from the context.

The samples were first prepared and mounted on slides for insertion into the LA chamber. Sixty-three samples were analyzed from Chiquiuitan and did not vary drastically in size, generally ranging from lengths of 2 cm to 1.0 mm (while these artifacts were very small, not all could be considered microdebitage under Fladmark's (1982:501) traditional definition, but are more likely the size of small artifact that many archaeologists may encounter). However, the 162 obsidian microdebitage artifacts from El Baúl did range in size and were sorted into four size categories using metal geological screens. The four size classes used for this study were: 3.18 mm, 2 mm, 500 μ m, and 250 μ m. The smallest size category was the most challenging to handle in this analysis, but provided the most information regarding the potentials of LA-

ICP-MS to approach micro-sized archaeological samples (see Figure 2).

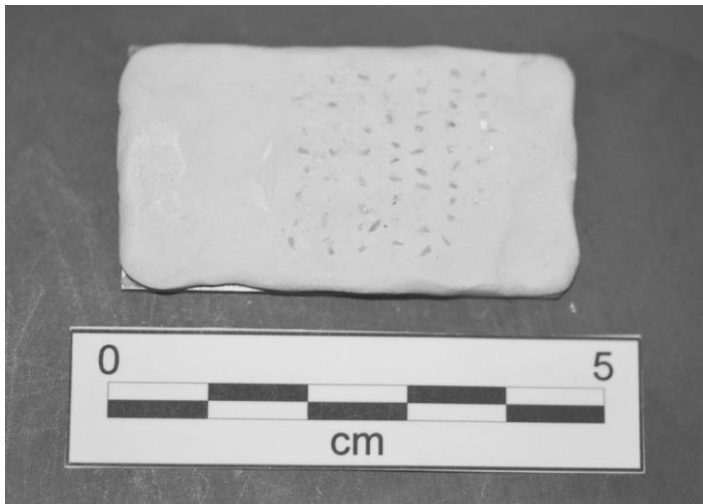


Figure 2. Photograph of the slide mount with the obsidian microdebitage.

Once the analysis was run, the OptiMass 8000 program allowed data to be accessed and exported to an Excel spreadsheet. These data represented averages of the counts taken of different atomic masses in the five integrations, which needed to be calibrated to access the actual sample data. In this study, data was calibrated using silicon as an internal standard and correcting for oxygen (the only element not accounted for by the mass detector) using the Gratuze method (for discussions of calibration methods see Gratuze 1999 and Speakman and Neff 2005). At this point, the blanks (test runs conducting without ablation of any sample) and standards (known samples analyzed to monitor the performance of the machines) were removed from the database and values were transformed to log-base 10 to yield more normalized distributions of composition. The resulting data indicated the raw ppm of the actual compositional components of the analyzed samples and were plotted in illustrations using the Gauss program to reveal compositional source groups.

Conclusions

There are several results of this study. First, we succeeded in testing the efficiency of the LA-ICP-MS technique on very small, thin obsidian artifacts. In this case, we tested flakes or flake fragments of sizes as small as 250 μ m. Even at this small size, LA allowed us to target the tiny artifacts for sample introduction (see Figure 3), and the ICP-MS unit was able to detect compositional components without problem.

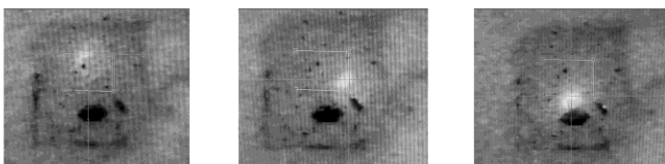


Figure 3. Photograph of the line of laser ablation on the obsidian microdebitage, taken from the computer monitor.

Some elements are especially useful in illustrating different chemical composition between obsidian from various sources. Arsenic (As) is a metalloid that exists in several oxidized forms as crystals. Cesium (Cs) is a naturally occurring alkali metal. By plotting the ppm quantities of these two chemical elements from each sample, it is possible to see the clustering of the three obsidian groups (see Figure 4).

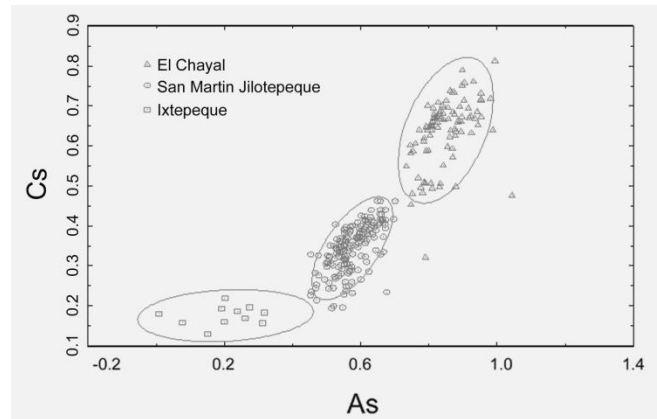


Figure 4. Bi-variant projection of Arsenic and Cesium in ppm, with ellipses of 90% confidence.

These clusters also include samples from the known sources that were analyzed through LA-ICP-MS to confirm group assignments, securing their identification with these particular origins. Praseodymium (Pr) is a rare earth metal that also differs between obsidian sources, and can be used to further illustrate these groups corresponding to Guatemalan sources, El Chayal, Ixtepeque, and San Martin Jilotepeque (see Figure 5).

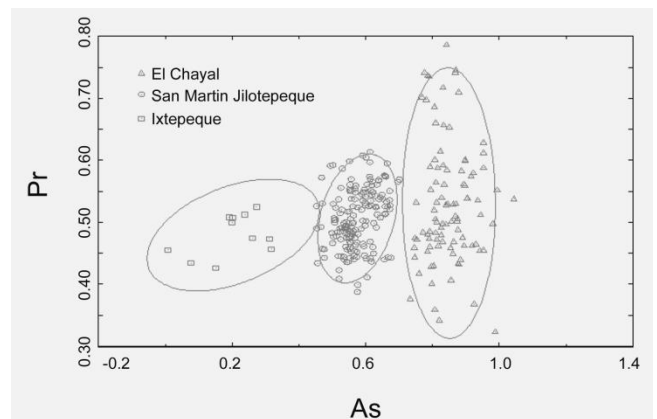


Figure 5. Bi-variant projection of Arsenic and Praseodymium in ppm, with ellipses of 90% confidence.

Second, this study confirmed that material below 1mm can often be virtually impossible to visually source, but LA-ICP-MS can be a valuable technique for sourcing this small debitage, which is often the only byproduct left in the archaeological record that can be used to identify primary contexts for obsidian production. Effective sourcing of small artifacts such as these is not possible using techniques like X-ray Fluorescence (XRF), which requires a minimum dimension for analysis (Glascok et al. 2005:32).

Lastly, the identification of the sources of obsidian found in archaeological contexts from Formative period Chiquiuitan and Late Classic El Baúl indicate significant trends in the procurement of this resource and its use by the inhabitants of these ancient sites. Here, only a few preliminary trends are mentioned. For Chiquiuitan, the visual identification of an obsidian assemblage largely attributed to the source of El Chayal has been reinforced. In fact, 57 of the 63 artifacts tested, or 90%, were from Chayal (see Figure 6). The less intensive exploitation of Ixtepeque and San Martin Jilotepeque was also seen in visual analysis and further indicated in the LA-ICP-MS study. Two artifacts came from Ixtepeque, while four were identified from San Martin Jilotepeque.

	Chiquiuitan	El Baúl	Total
El Chayal	57	10	67
Ixtepeque	2	0	2
S.M. Jilotepeque	4	152	156
Total	63	162	226

Figure 6. Table of the LA-ICP-MS results from Chiquiuitan and El Baúl, showing the quantities of obsidian from the sources of El Chayal, Ixtepeque, and San Martin Jilotepeque.

These data suggest that residents of Chiquiuitan may have had unequal access to these sources at the Early Formative-Middle Formative transition. More specifically, of the four mounds excavated in 2006 and 2007 seasons at Chiquiuitan, obsidian from Ixtepeque and San Martin Jilotepeque were found in greater frequencies in two specific mounds. Mound 34 demonstrated 14% of obsidian from Ixtepeque, while Mound 24 exhibited 50% obsidian from San Martin Jilotepeque, the rest of the obsidian from both mounds being attributed to El Chayal. In comparison to Mound 13, the most intensively excavated mound at the site, no obsidian came from Ixtepeque and only 2% from San Martin Jilotepeque, while the majority 98% was sourced to El Chayal.

At El Baúl, the results indicate that the single obsidian deposit EB9-P31-06 primarily represented the source of San Martin Jilotepeque. Of the 162 obsidian artifacts sourced, 152, or 94%, came from San Martin Jilotepeque (see Figure 6). Only 10 artifacts, or 6%, were chemically matched to El Chayal, and no obsidian from Ixtepeque was recorded from the El Baúl sample.

These source ratios differ significantly from previous analysis at El Baúl that point to El Chayal as the dominant source (Chinchilla 2004; Appendix by Edgar Carpio), and this certainly highlights the some of the problems that can be encountered with visually sourcing obsidian debitage. The results presented here do reinforce that this special deposit represents a single production event given the homogeneity in obsidian source. The primary reliance on San Martin Jilotepeque is interesting in that it is common to see El Chayal as the predominant source at many sites during the Late Classic period. These findings require further research, but this technique did highlight the need for further inquiry.

The success of this technique on microdebitage from these sites demonstrates that microdebitage can be used to trace changes in source utilization through time and space within archaeological sites. The analysis of microdebitage from floor contexts is highly significant in that it allows archaeologists to source primary refuse from the actual location of production, not the secondary refuse that may or may not represent the obsidian artifacts actually produced at the site. This is especially significant for the stratified floor contexts in much of the Maya area, and during early periods where the density of obsidian artifacts may be very low, as in the case of Chiquiuitan. The quantity of analyzable obsidian materials dramatically increases when microdebitage is included in the artifact assemblage. For sites like El Baul with a proliferation of artifacts and microdebitage numbering in the tens of thousands, this can be a productive method for quickly sourcing a large number of artifacts and identifying the source of that refuse that may in other ways be impossible.

Acknowledgments

We would like to thank the IIRMES Visiting Researcher Program funded by the National Science Foundation (BCS-0604712) and the staff at IIRMES, especially James Daniels, Adrian Abella and Carl Lipo. For support of the Chiquiuitan Archaeological Project (Molly Morgan and Judith Valle directors): IIE Fulbright, FAMSI grant #07017, The New World Archaeological Foundation and Dr. John Clark, and Vanderbilt University. For support of the Proyecto Arqueológico Cotzumalguapa (Oswaldo Chinchilla director): Museo Popol Vuh of Universidad Francisco Marroquín, Wenner-Gren Foundation grant #6787 and FAMSI grant #02023. Finally, we thank the Institute of Anthropology and History of Guatemala.

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Archaeological Ceramics

Charles C. Kolb, Associate Editor

The column in this issue includes six topics: 1) Reviews of Books on Archaeological Ceramics; 2) Previous Meetings; 3) Forthcoming Meetings; 4) Exhibition; 5) Training Opportunity; and 6) New Journal.

Reviews

Beyond Pots and Pans: A Study on Chalcolithic Balathal.

Anup Mishra. Aryan Books International, New Delhi: 2008. xxii + 350 pp., 23 color plates, 170 figures, maps. Price: US\$155.60 (although cheaper at booksellers online). ISBN: 817305343X. This volume focuses on the Chalcolithic and Early Historic era archaeological site of Balathal (4540-2050 BCE) discovered in 1964 and located 40 km northeast of Udaipur city in District Udaipur, Rajasthan, India. The author, Anup Mishra, is currently affiliated with the Department of Ancient History and Culture, M.J.P. Rohilkhand University, Bareilly. At present he is actively engaged in exploration and excavation of Early Iron Age sites in the region of Upper Ganga Valley. The ceramic research reported herein is derived from his doctoral dissertation (Deccan College, Pune) and incorporates a description of the site, an essay on the method and theory of ceramic studies, provides details on ceramic typology and morphology for three chronological phases, has a discussion of ceramic production from raw materials collecting to firing, elaborates the diachronic evolution of six ceramic wares, includes a comparison of the results of the ceramic studies with materials from other sites and a treatise on local modern village potters; in addition, there is a catalog of the ceramic wares recovered from the excavations. The narratives in this comprehensive compendium are accompanied by 110 black-and-white illustrations, 49 tables, 23 color plates, and an additional 96 figures in the catalog. The bibliography contains 377 entries and there is a conflated six-page double-column index of topical terms and proper nouns. There is an obligatory "Foreword," "Preface," and a "List of Illustrations."

While studying the ceramics of Balathal, Mishra strives to go beyond descriptions of "pots and pans" in order to penetrate into hitherto unknown aspects of Ahar Culture. In addition, considering the paucity of standard books on ceramics available in India, he provides a brief account on ceramic data retrieval, recording, ordering, description, tabulation, analysis and synthesis of results to "achieve objectivity." One focus is on the importance of ceramic variability and quantitative analysis, and how these may be useful in interpreting the cultural processes and lifeways of the settlement. He employs XRD and thin section analyses in classification of ceramics and to understand the technologies employed, the provenance of raw materials, and the identification of local and non-local ceramics.

The narrative consists of seven chapters, and an appendix and the catalog. "Chapter 1: Introduction" (pp. 1-34) is a brief introduction to the history of research on ancient ceramics in India. In addition, he documents the protohistoric cultures of Rajasthan and characterizes Ahar culture and its physiographic setting, climate, flora, and fauna, soils and people. The objectives of his study are reviewed and details related on ceramic data collection, and general methodologies. He considers ceramic studies on motifs (Marshall 1931 and Mackay 1938) and ceramic types (Marshall 1931, Wheeler 1962, and Lal 1954 and 1977), as well as scientific procedures (XRD, NAA, and ESR), and reviews briefly the characteristics of a series of cultures: Pre-Harappan, Harappan, Black-and-Red Ware, Painted Grey, and Ahar. Mishra focuses on Ahar Culture, and provides maps of the regional geology, drainage, and site distributions. A useful discussion of the methodology of ceramic studies includes eight components (Table 2) and concludes the introduction. "Chapter 2: Balathal" (pp. 35-42) is a brief review of the site and excavations (trenches and stratigraphy), and two periods: Period I: Chalcolithic (architecture, pottery kilns, ceramics, and other artifacts) and Period II: Early Historic (houses, a ceramic assemblage with five wares, and other objects). Mishra's "Chapter 3: Theory and Method of Ceramic Study" (pp. 43-72) is a traditional discussion of ceramic classification as employed at Balathal and covers structural classification, vessel sizes, formal attributes, (rim, neck, shoulder, body, and base measurements and characteristics), stylistic attributes, functional attributes, texture analysis, mineral compositions, and hardness. X-ray Diffraction Analysis (XRD) was performed on 124 specimens in seven ware categories (pp. 56-59) and 51 thin sections were also made and analyzed (pp. 59-60).

"Chapter 4: Study of Ceramic Morphology and Typology" (pp. 73-121) contains details on Fine Wares and Coarse Wares for each of five chronological phases: Phase A, Beginning Phase: A1: Early Beginning Phase and A2: Late Beginning Phase; Phase B, Transitional Phase; and Phase C, Mature Phase: C1: Early Mature Phase and C2 Late Mature Phase. Mishra reviews the basics of pottery manufacture in "Chapter 5: Ceramic Technology" (pp. 122-128), commenting on the collection and processing of clay, hand molding, luting, perforating and cutting, removal of excess clay, dabbing, slipping and burnishing, rustication, decoration, and firing. The "Evolution of Ceramics" (pp. 129-153) is the topic of Chapter 6 in which the author discusses in detail the evolution of each of

five wares and provides “metamorphic” analyses (diachronic assessments). The ceramics documented are: Black-and-Red Ware (including details on the motifs), Thick Slipped Red Ware, Grey Ware, Thin Red Ware, Tan/Chocolate Slipped Ware, and Reserve Slip Ware.

“Chapter 7: Discussion and Conclusion” (pp. 154-200) considers a variety of topics and draws upon materials from the preceding chapters. Mishra begins with a discussion of the distribution of Chalcolithic Phases in different portions of the site (eastern, western, northern, southern and central) and describes the ecological; setting and land-use patterns. He emphasizes Phase A1 in terms of dwellings, ceramics, other material culture, and faunal and floral remains before comparing data from a dozen other Chalcolithic era sites including Lothal, Rangpur, Surkhotada, Padri, Dholavira, Kantasi, Nagawada, and Loteshwar. The possibilities of migration and foreign origins are also reviewed briefly. Using a “techno-typological” comparison, Mishra considers the Harappan affinity of Balathal and Lothal ceramics (pp. 169-178) in terms of technologies and vessel shapes (n = 11). Problems of Black-and-Red Ware are discussed in reference to similar ceramics from six sites (pp. 178-184) and three forms of variability (technological, stylistic, and gender role) and “food habits” are inadequately discussed (pp. 184-187). In terms of the economics of ceramic production, the author asserts Phase A (Beginning Phase) as demonstrating household production with Phase C (Mature Phase) as a workshop industry. These statements require elaboration and documentation. Local and regional trade and commerce (pp. 189-191) and the role of climatic fluctuation (pp. 191-194) are also scanty on factual information that would substantiate his assertions. Chronological data is presented at the end of these narratives and reports calibrated radiocarbon dates: Phase A: 4520-4340 BC; Phase C1: 3360-2888 BC; and Phase C2: 2400-2050 BC. The XRD and thin section studies are mentioned in a paragraph (p. 198) but the actual scientific methodology, analysis, and data are not presented in this monograph.

A ceramic ethnoarchaeological report is included in “Appendix I: Modern Potters of Vallabhnagar, District Udaipur, Rajasthan: An Ethnographic Study” (pp. 202-216) but information presented here could have been better incorporated into the preceding narratives and Chapter 7. This village study was conducted in January and February 1997 at Vallabhnagar, a potters’ village located only 6 km southeast of the Balathal archaeological site. Mishra reviews information about potter’s houses and workshops, the division of labor, children as apprentices, the collection and processing of clay (pounding and sieving, paste preparation, mixing of clays and tempers, and kneading), the characteristics of the wheel and wheel throwing, and post-wheel throwing (dabbing, polishing, burnishing and slipping). The characteristics of Red Ware, Black Ware, decorations, and hand moulding are reported as are two types of firing, open and closed, and the fuels employed. The breakage of pots, vessels forms and their functions, marketing, the barter system, economics, social life, marriage and lineages, and festivals and myths are also noted in this brief assessment.

“Appendix II: Catalogue” (pp. 217-329) is a traditional catalog of the Chalcolithic ceramics excavated at Balathal chronologically organized with discussions of the ceramic wares within each of the five phases. Phase A1: Early Beginning Phase (pp. 217-221, Figs. I-IX) includes seven wares: Sturdy Red, Perforated and Buff, Black-and-Red, Reserved Slip, Red Slipped, Coarse Red, and Grey. Phase A2: Late Beginning Phase (pp. 221-225, Figs. XI-XXIV) includes nine: Sturdy Red, Black-and-Red, Perforated and Reserve Slip, Painted Red Slip Red Ware, Red Slipped, Red, Coarse Red, and Grey. Phase B: Transitional Phase (pp. 225-233, Figs. XXVII-XLI) details eight: Fine Red, Unslipped Red, Reserved Slip, Red Slipped, Black-and-Red, Red Washed, Coarse Red, and Grey. Phase C1: Early Mature Phase (pp. 234-243, Figs. XLIII-XLXIX) includes nine: Thin Red, Black-and-Red, Tan, Chocolate Slipped, Reserved Slipped, Painted Buff, and Thick Red Slipped. Grey, and Coarse Red. Lastly, Phase C: Late Mature Phase (pp. 243-255, XLII-XCVI) documents eight: Thin Red, Black-and-Red, Tan, Perforated, Reserve Slip, Thick Red Slipped, Grey, and Coarse Red. There are no Figures numbered X, XLII, or XLXX. Unfortunately, the catalog entries do not indicate the quantities of sherds assigned to each of the wares, but do relate information on frequencies, continuities from phase to phase, and potentials of local manufacture versus imports.

There is much to admire about this detailed, meticulous presentation. The publisher’s “blurb” suggests that “this book will be useful for the beginners as well as researchers of the subjects of archaeology, history and anthropology.” It is certainly useful for students and other beginners but is wanting in the area of sociocultural interpretation and inferences. Considering the paucity of standard works on ceramics available in India, the author has, indeed, provided a useful but brief account on ceramic data retrieval, recording, ordering, description, tabulation, and analysis. One goal was to “go beyond descriptions of ‘pots and pans’ in order to penetrate into hitherto unknown aspects of Ahar Culture” -- this, too, is partly achieved. Readers would like to know more about the site excavation and, especially, the types and quantities of artifacts recovered in the five phases as well as the interrelationships of the material culture and structures. The discussion of ceramic classification covers the basics of structural classification, vessel sizes, various attributes (formal, stylistic, and functional attributes), texture analysis, compositions, and hardness. Lip service is paid to XRD and the thin section analyses and what they can tell us. The descriptions of the ceramic types for each of the five chronological phases are well documented. The review of pottery manufacture in Chapter 5 is appropriate but seems misplaced in the discussion (logically, it would have greater value had it been incorporated earlier), but the discussion on the “Evolution of Ceramics” is detailed and appropriate.

The essay on ceramic ethnoarchaeological from the modern village of Vallabhnagar would benefit from additional images; strangely, Mishra does not cite Carol Kramer’s classic monograph *Pottery in Rajasthan: Ethnoarchaeology in Two Indian Cities* (Smithsonian Institution Press, Washington, DC: 1997); see also Charles C. Kolb’s review of Carol Kramer’s

Pottery in Rajasthan: Ethnoarchaeology in Two Indian Cities, (H-Asia, H-Net Reviews, March 1998, <http://www.h-net.org/reviews/showrev.php?id=1812>). Although Dean Arnold's *Ceramic Theory and Cultural Process* (Cambridge University Press, Cambridge and New York: 1985) is cited in the bibliography, minimal use is made of its contents in interpreting the data Mishra assembled in this volume. Cathy Costin's refined paradigm on ceramic production might also have been employed to particular advantage: Craft specialization: issues in defining, documenting, and explaining the organization of production, in Michael B. Schiffer (ed.), *Archaeological Method and Theory, Vol. 3*, University of Arizona Press, Tucson: 1991, pp. 1-56; Craft Production Systems, in Gary M. Feinman and T. Douglas Price (eds.), *Archaeology at the Millennium: A Sourcebook*, Kluwer/Plenum, New York: 2001, pp. 273-327; and Craft Production, in Herbert D. Maschner and Christopher Chippindale (eds.), *Handbook of Archaeological Methods*, Altamira Press, Walnut Creek, CA: 2005, pp. 1034-1107. In sum, Mishra has prepared an important volume that describes the ceramics at a particular Chalcolithic period archaeological site. However, the ecological discussion is cursory and the sociocultural interpretations are minimal and, hence, have barely gone beyond "pots and pans."

In the Aftermath of Migration: Renegotiating Ancient Identity in Southeastern Arizona. Anna A. Neuzil. Anthropological Papers 73. University of Arizona Press, Tucson: 2008. ix + 124 pp, 32 figures, 51 tables, Price US\$17.95 (paper). ISBN: 9780816527366. Neuzil earned her Masters and received her doctorate from the University of Arizona and served as a ceramic analyst and project director in the Archaeology Department of Tierra Right of Way Services, a Land Services Company in Tucson, Arizona. She currently is project director and principal investigator with Ecoplan Associates, Inc. in Tucson. The monograph under review is based on her doctoral dissertation (2005) that focused on the Safford and Aravaipa valleys of southeastern Arizona (northeast of Tucson) and data from the Goat Hill site and 34 others in these valleys during the Classic period (1200-1450 CE). The two-stage research design initially involved an analysis of the technological styles of "low visibility" utilitarian ceramics and domestic architecture which enabled her to differentiate between household and suprahousehold groups in the archaeological record. After identifying these groups, "high visibility decorated ceramics" and the analysis of the domestic architecture were employed to identify the groups and their migration patterns from northeastern Arizona to southeastern Arizona. Petrographic analysis and XRF were used to clarify interactions and evaluate if the patterns observed could be explained by social mechanisms other than migration.

The Safford and Aravaipa valleys have, she writes, "always lingered in the wings" of Southwestern archaeology, away from the spotlight held by the more thoroughly studied Tucson and Phoenix Basins, the Mogollon Rim area, and the Colorado Plateau. Nonetheless, these two valleys hold intriguing clues to understanding the social processes, particularly migration and the interaction it engenders, that led to the coalescence of ancient populations throughout the Greater Southwest in the

fourteenth and fifteenth centuries CE. Because the Safford and Aravaipa valleys show cultural influences from diverse areas of the Prehispanic Southwest, particularly the Phoenix Basin, the Mogollon Rim, and the Kayenta and Tusayan region, they serve as a microcosm of many of the social changes that occurred in other areas of the Southwest during this time. Neuzil's research examines the social changes that took place in the Safford and Aravaipa valleys during the thirteenth through the fifteenth centuries CE as a result of an influx of migrants from the Kayenta and Tusayan regions of northeastern Arizona. Focusing on domestic architecture and the ceramics, the author evaluates how migration affected the expression of identity of both migrant and indigenous populations in the Safford and Aravaipa valleys and she provides a model for research in other areas where migration played an important role.

This slim volume contains six chapters, 303 references cited (pp. 101-115), a five-page triple-column index of key terms and proper nouns, and English and Spanish language abstracts. Briefly, the chapters and content include: "Chapter 1: Migration and Identity in the Archaeological Past" (pp. 1-15) which focuses on models of migration, issued in determining identity, and modeling the consequences of migration on identity. In the subsequent chapter, "Archaeological Setting of the Safford and Aravaipa Valleys" (pp. 16-27), she considers previous archaeological research in the two valleys and discusses chronology and diachronic cultural change. The chronological tables (Fig. 2.2a and 2.2b) are especially helpful as is Table 2.1, which details the Classic period phases in each of these valleys and describes the architecture, ceramic types, and provides sociocultural interpretations. "Chapter 3: Identifying Migrants in the Archaeological Record" (pp. 28-45) emphasizes corrugated ceramics and production technologies, as well as domestic architecture (site layout, room area, and construction techniques). Two images of corrugated ceramics (Figs. 3.1 and 3.2), are not clear.

Neuzil's "Chapter 4: Examining Migrant and Indigenous Identity in the Postmigration Social Environment" (pp. 46-68) documents nearly one hundred decorated ceramic types, their dates, and references. "Richness and evenness" (Brillouin) scaled values by phase for ceramic types and wares are also presented for 33 sites, and cluster analysis data, space syntax analyses, and integration scores are also reported. Settlement locations of the emigrants and indigenous occupants are documented and she discusses social integration. Evidence from obsidian and ceramic sourcing analyses are reported in the subsequent section, "Chapter 5: Differentiating Migration and Exchange Through Studies of Obsidian and Decorated Ceramics" (pp. 69-86). Obsidian source data comes primarily from Stephen Shackley's research (2002, 2005). The pottery (n = 117 sherds) was assessed by oxidation analyses (refiring) and petrographic data revealed 17 distinct petrofacies based on analysis of 85 samples of sands and 273 sherds from archaeological sites in the two valleys. Elizabeth Miksa, Carlos Lavayan and intern San Duwe performed these studies. Neuzil's assessment of the obsidian and ceramic data suggest that migrant and indigenous groups became increasingly spatially and socially integrated through time as seen in architectural changes and a shift towards one type of decorated

pottery, Roosevelt Red Ware, in the thirteenth century. In "Chapter 6: The Scale and Effect of Migration in the Safford and Aravaipa Valleys" (pp. 87-100), the author reviews the social scale of migration, locations and characteristics of migrant enclaves and non-migrant settlements, the extent of migration and its effects on social identity. Lastly, Neuzil proposes a model and suggests that it can be applied to migration research in the Greater Southwest.

This compelling study is well documented and provides archaeologists a wealth of information on these little-known valleys, contextualizes this significant and intriguing time period, and provides a paradigm that can be employed in other areas of the Southwest and potentially in other areas where ceramics and regional chronologies are understood. This case study on migration helps us understand long-term implications for both migrants and the indigenous people they impacted.

Vessels Inside and Outside: Proceedings of the Conference EMAC '07 9th European Meeting on Ancient Ceramics, 24-27 October 2007, Hungarian National Museum, Budapest, Hungary. Katalin Biró, Veronika Szilágyi, and Attila Kreiter (eds.). Hungarian National Museum, Budapest: 2009. 292 pp. Price €45.00. ISBN 978-963-7061-67-7. This volume, which has recently become available, may be obtained from Dr. Endre Tóth, Head Librarian, Library of the Hungarian National Museum, H-1088 Budapest, Múzeum körút 14-16. Email Dr. Tóth at teutanus@freemail.hu. The volume contains a "Preface" (pp. 3-4) followed by eight topical sections containing 36 papers; each contribution has its own references. I shall briefly describe the papers within each section.

"Methodological Development" (7 papers): Greene, A., and Hartley, C. "From analog to digital: Protocols and program for a systematic digital radiography of archaeological pottery" (pp. 5-14, 6 figures, 2 tables); research using X-ray Digital Radiography and computerized tomography on Achaemenid era Armenian specimens are discussed. Hein, A., Müller, N. S., and Kilikoglou, V. "Great pots on fire: Thermal properties of archaeological cooking ware" (pp. 15-20); thermal conductivity data for Aegean Bronze Age specimens are reviewed. Mara, H., Trinkl, E., Kammerer, P., and Zolda, E. "3D-acquisition of Attic red-figured vessels and multi-spectral readings of white ground *Lekythoi* in the *Kunsthistorisches Museum Vienna*" (pp. 21-28, 3 figures, 1 table); multispectral data on Attic ceramics are detailed. Daszkiewicz, M., Schneider, G., Haeser, G., Bobryk, E., and Baranowski, M. "Possibilities and limitations of macroscopic determination of pottery fabrics in the field" (pp. 29-36, 5 figures); the authors consider the important topics of discrepancies of field versus archaeometric WD-XRF fabric analyses are presented using pottery from Oman as a test case. Ikäheimo, J. P., and Peña, J. T. "The Palatine East Pottery Project: A holistic approach to the study and publication of an excavated pottery assemblage from Rome" (pp. 37-42, 7 figures); form and fabric analysis using NAA are reported on Roman pottery and detailed at <http://www.acsu.buffalo.edu/~tpena/index.htm>. Kasztovszky, Zs., Biró, K. T., Gherdán, K., Boti, A., Sodo, A., and Sajo-Bohus, L. "Applicability of Prompt Gamma Activation Analysis to archaeometry of pottery" (pp. 43-46, 2 figures, 2

tables); PGAA data are compared to XRF data for ceramics from Neolithic Szarvas, Hungary and the Otranto Byzantine kiln in Italy. Mihály, J., Komlósi, V., Tóth, A., Tóth, Zs., and Ilon, G. "Vibrational spectroscopic study of pigment raw materials and painted ceramics excavated at Szombathely-Oladi Plató, Hungary" (pp. 47-52, 8 figures); FTIR and FT Raman spectra information is presented for Late Neolithic Hungarian pottery.

"Production/Distribution/Trade" (12 papers): Muntoni, M. I., Eramo, G., and Laviano, R. "Production of Mid-Late Neolithic 'Serra d'Alto' Ware in the Bradanic Trough (south-eastern Italy)" (pp.53-62, 5 figures, 5 tables); information from mineralogical and chemical analyses of Neolithic Italian specimens are documented. Odriozola, C. P., Pérez, V. H., Dias, M. I., and Valera, A. C. "Bell Breaker production and consumption along the Guadiana River: An Iberian perspective" (pp. 63-70, 6 figures, 1 table); the authors present XRF results on Iberian Copper age pottery. Taubald, H. "Archaeometrical analysis of Neolithic pottery and comparison to potential sources of raw materials in their immediate environment – An overview"(pp. 71-76, 9 figures); XRF analyses of Neolithic Hungarian ceramics are reported. Vila, L., Buxeda i Garrigós, J., Kilikoglou, V., and Hein, A. "Roman amphorae around the change of an era: Production and consumption patterns in the north-east of the Iberian Peninsula" (pp. 77-82, 4 figures); 970 amphorae specimens from Iberia are studied using XRF, XRD, and SEM. Dias, M. I., Viegas, C., Gouveia, M. A., Marquez, R., Franco, D., and Prudêncio, M. I. "Geochemical fingerprinting of Roman pottery production from Manta Rota kilns (Southern Portugal)" (pp. 83-90, 7 figures, 1 table); amphorae from southern Portugal are assessed using chemical and mineralogical techniques. Holmqvist, V. E. "Ceramic production traditions in the Late Byzantine-Early Islamic tradition: A comparative analytical study of ceramics from Palaestina Tertia" (pp. 91-96, 3 figures, 1 table); Byzantine ceramics from Jordan and Israel are studied using ED-XRF and SEM-EDS. Ambrosini, L., Felici, A. C., Fronterotta, G., Piacentini, M., and Vendittelli, M. "Non-destructive analysis of a red figure vase of uncertain attribution from Falerii Veteres" (pp. 97-102, 4 figures, 1 table); Attic ceramics are analyzed by XRF. Brodà, Y., Cannavò, V., Govi, E., Levi, S. T., Marchetti Dori, S., and Pellacani, G. "Bronze Age Terramare pottery from Northern Italy: Exercises in experimental reproduction" (pp.103-110, 7 figures, 2 tables); the results of experimental archaeology in measuring technical and artistic difficulty related to Italian Bronze Age pottery is reported. Odriozola, C. P., Sanjuán, L. G., Dias, M. I., and Wheatley, D. W. "A preliminary approach from material science to Copper Age funerary pottery in southern Iberia: The Palacio III (Sevilla, Spain) *Tholos* tomb" (pp. 111-118, 7 figures, 2 tables); WD-XRF and Cluster analysis using Ward's method are reported for materials from Copper Age southern Iberia. Odriozola, C. P., and Pérez, V. H. "The two sides of the Guadiana inlaid pottery from the 3rd millennium BC alongside the Guadiana River (Spain and Portugal)" (pp. 119-122, 3 figures, a table); the authors employed XRD and FTIR on bone-inlaid pottery from Spain and Portugal. Schneider, G., Daszkiewicz, M., Zsidi, P., and Ujlaki Pongracz, Zs. "Analysis of Roman pottery and lamps from Aquincum and Intercisa"

(pp. 123-132, 1 figure, 3 tables); WD-XRF results on specimens from Roman sites in Hungary are reported. Schubert, C., and Pernicka, E. "Provenance studies on Trojan Late Bronze Age fine wares from Troy and its neighbourhood using Neutron Activation Analysis (INAA)" (pp. 133-138, 6 figures, 2 tables); 200 samples of Anatolian Grey Ware and Tan Ware were analyzed by NAA.

"Dating Pottery" (1 paper): Blain, S., Guibert, P., Bouvier, A., Sapin, Ch., Prigent, D., and Baylé, M. "Ceramic building material dating applied to Early Medieval building archaeology in North-western France" (pp. 139-144, 6 figures); TL dating results of brickmaking is reported for four buildings – annual dose rate, paleodose, characterization, and mortar analysis are documented. "Pottery as Containers" (3 papers): Müller, N. S., Kilikoglou, V., Day, P. M., Hein, A., and Kekinis, G. "The influence of temper on performance characteristics of cooking ware ceramics" (pp. 145-150, 4 figures, 1 table); thermal shock resistance and thermal conductivity results are documented for pottery vessels from Bronze Age Akrotire, Thera (Greece). Cottica, D., and Mazzocchin, G. A. "Pots with coloured powders from the Forum of Pompeii" (pp. 151-158, 4 figures, 1 table); Roman wall paintings are assessed using EDS and FTIR. Olcese, G., and Thierrin-Michel, G. "Graeco-Italic amphorae in the region of Ostia: Archaeology and archaeometry" (pp. 159-164, 7 figures, 1 appendix); specimens from five groups of amphorae were analyzed using WDS-XRF and WDS-FRS.

"Ceramics as Building Materials" (3 papers): Starnini, E., and Szakmány-Michel, G. "Besides vessels: Investigating Early Neolithic fired clay artefacts from Hungary" (pp. 165-172, 5 figures); results from a study using petrography, XRF, and XRD are documented. Capelli, C., Cabella, R., and Piazza, M. "Mineralogical and petrographic analyses of tiles (Tegulae) from the Late Roman necropolis of Priamar, Savona (Liguria, NW Italy)" (pp. 173-178, 2 figures); results from thin section analysis and XRD suggest heterogeneous production sites. Kovács, T., Szakmány, Gy. T., Biró, K., and Tóth, M. "Daub: Between pottery and sediment" (pp. 179-186, 11 figures, 1 table); daub from Neolithic contexts in western Hungary were studied using XRD, XRF, INAA, and SEM-EMPA. "Ceramics in Conservation" (1 paper): Nel, P. "Issues associated with adhesives used on archaeological pottery" (pp. 187-196, 4 tables); FTIR analyses of four major groups of adhesives previously used on Cypriot ceramics are reported.

"Slips and Glazes" (4 papers): Pacheco, C., Chapoulie, R., Dooryhee, E., Aucouturier, M., Bouquillon, A., Marariou, S., and Miroudot, D. "Gilded Medieval Islamic glazed ceramics: Production process and evolution in the Iranian world (12th-12th c.) and the Timurid Empire (14th-15th c.)" (pp. 197-206, 6 figures, 4 tables); XRD and RBS are used in a study of gold relief decoration on Timurid tiles and Iranian sherds. Maggetti, M., Morin, D., and Serneels, V. "High-Mg faience from Granges-le-Bourg (Haute Saône, France)" (pp. 207-216, 6 figures, 2 tables); firing temperature data from the experimental firing of various paste recipes are studied by XRF. Ricciardi, P., Amato, F., and Colomban, Ph. "Raman spectroscopy as a tool for the non-destructive characterization of slips and glazes of a 'sgraffito' Renaissance production" (pp. 217-222, 5

figures, 3 tables); the results of SEM-EDS and Raman spectroscopy on materials from Tuscany are reported. Amato, F., Ercolani, G., Fabbri, B., and Gualtieri, S. "Chemical classification of the slip layers in Italian ceramics of the 15th-17th century" (pp. 223-230, 3 figures, 2 tables); thin section analysis and SEM-EDS data are documented.

"Petrographic Aspects to the Study of Pottery" (5 papers): Vince, A. "Pottery supply over three millennia: Petrologic and geochemical ceramic characterization at Melton, East Yorkshire, UK" (pp. 231-240, 4 figures, 6 tables); thin section analyses and ICPS data on 137 specimens dated to the Early Bronze age through Medieval period are reported. Jorge, A., Day, P. M., and Dias, I. "Technological choices at the onset of the Iberian Bronze Age pottery from the Mondego Plateau, Portugal" (pp. 241-246, 5 figures); a study of 168 thin sections from Late Chalcolithic and Early Bronze Age Portugal are documented. Bezezcky, T., and Mange, M. A. "New petrographic data of the Laecanius and imperial workshop in Fažana (Istria, Croatia)" (pp. 247-254, 5 tables); a diachronic study of 9 fabric types of Roman amphorae from 3 production periods utilized thin section and XRD. Gregor, M., and Čambal, R. "Preliminary mineralogical and petrographic study of La Tène household ceramics from Bratislava's oppidum (Slovakia): (pp. 255-264, 5 figures, 2 tables); the preliminary results of granulometric analyses and firing temperatures employing PXRD and mineral and petrographic analyses are reported. Gherdán, K., and Horváth, T. "Petrographic investigation of the finds of Balatonöszöd-Temetői dűlő Baden settlement" (pp. 265-276, 4 figures); petrography was employed in a study of pottery and daub from Copper Age Hungarian sites.

The volume concludes with an "Author Index" (pp.277-278), "List of Participants (pp. 279-284), [Table of] "Contents" (pp. 285-288), and "Supporters of the Meetings and Proceedings" (pp. 289-290). The is a splendidly edited and published volume that is a worthy addition to the literature on European ceramics and especially adds to our knowledge of southeastern and central Europe.

Salt-glazed Stoneware in Early America. Janine E. Skerry and Suzanne Findlen Hood. Colonial Williamsburg Foundation, Williamsburg, VA (distributed by the University Press of New England): 2009. xvi + 271 pp., 297 color illustrations, 190 black-and-white figures, 2 tables, 615 endnotes. Price US\$75.00 (cloth). ISBN 978-1-58465-820-7. The authors are both affiliated with the Colonial Williamsburg Foundation, Williamsburg, Virginia, USA: Skerry as curator of ceramics and Hood as associate curator of ceramics and glass. Using the Colonial Williamsburg's archaeological collections of salt-glazed stoneware (ca. 32,500 specimens) and other archaeological and documentary sources as well as materials from public and private collections, they have prepared a comprehensive volume on salt-glazed stoneware found in Eastern American contexts. They have carefully researched both German and English salt glazed wares imported into the colonies of early America, and the early production of this ceramic in the Eastern United States. The volume is art historical and archaeological, and provides a cultural history of

this important ceramic, chronicling the traditions of stoneware imported from England and Germany as well as the overlooked work of American potters during the eighteenth century. In some ways *Salt-glazed Stoneware in Early America* is reminiscent of David R. M. Gaimster's *German Stoneware, 1200-1900: Archaeology and Cultural History* (British Museum Press, London: 1997).

Stoneware, first developed in the Rhineland at the end of the 13th century, is a hard, non-porous ceramic, ideal for domestic use. Exported throughout Western Europe and to North America, its forms and decorations became increasingly sophisticated from the Renaissance, and the ware ceased to be made primarily as a utilitarian commodity. German stoneware provides an essential framework for chronology and social interpretations on archaeological sites from Britain and the continent to North America and beyond. Stoneware vessels were ubiquitous in colonial and early American homes. Imported from Germany and England and later domestically made, salt-glazed stoneware vessels became an integral part of daily life in America from the time of European settlement until the beginning of the last century. Because it is impervious to the harmful effects of highly saline or acidic solutions, salt-glazed stoneware was uniquely well suited for use in preparing and storing a wide range of liquids and foodstuffs. Particularly in the first half of the seventeenth century, before the development of the British green glass bottle industry, stoneware was the only appropriate material for foods preserved by pickling or brining. Even after glass bottles became prevalent, stoneware's durability made it the material of choice for both domestic and tavern use. According to the authors, stoneware may be brown, grey, or white and was fired at ca. 1200° C or 2,200° F. Three useful maps (pp. 3-5) accompany the narrative: "Key European Stoneware Production & Trade Sites" (focusing on Germany, The Netherlands, England and Scotland), "Key seventeenth and Eighteenth Century American Stoneware Archaeological Sites" (n = 15), and "Eighteenth-Century American Stoneware Production sites" (n = 32).

The book contains a "Foreword" (pp. viii-ix, 1 illustration), "Preface" (pp. x-xi), "Acknowledgments" (pp. xii-xvi), "Introduction" (pp. 1-2), "Maps" (pp. 3-5), an "Afterword" (pp. 222-225, 3 illustrations, 4 notes), a list of "Abbreviations for Institutions and Individuals Cited in Captions" (n = 21, p. 248), a comprehensive "Bibliography" (pp. 249-261) with 282 entries, and a three-column "Index" that includes topics, proper nouns, and illustrations (pp. 262-271). Seven chapters and three appendices document early salt-glazed stoneware in America. I shall next discuss the content of each chapter and the appendices

In Chapter 1, "Treasured Possessions and Everyday Objects: Rhenish Brown Stoneware" (pp. 6-29, 29 illustrations, 16 figures, 63 endnotes), the authors consider the famous Winthrop mug (1630), estate inventories, vessel forms (notable is the Bartmann bottle, long-neck mugs, and chamber pots), archaeological sites in the area of Jamestown and Williamsburg, Virginia, ceramics from Dutch East India Company shipwrecks, and the importance of bottle seals. Chapter 2, "Emblems of Church and State: Westerwald Stoneware" (pp. 30-63, 38

illustrations, 28 figures, 88 endnotes), focuses on Westerwald production, including molded gray and blue serving jugs (often depicting secular stories), ball-belly pitchers, *Sternkanne* (jugs decorated with stars), ovoid jugs, tankards, "GR" monogrammed jugs, tureens, teapots, flower pots, and chamber pots, as well as brown-colored mineral water bottles. With Chapter 3, "Britannia Rules the Waves: English Brown Stoneware" (pp. 69-91, 33 illustrations, 27 figures, 99 endnotes), the authors differentiate English from German brown stoneware vessels and review the importance of John Dwight's (1837-1703) Fulham pottery which made ale and porter bottles. Ceramic distribution in Maryland and Virginia are considered as is the Drummond Plantation site. A variety of English ceramics are documented: storage jars, pipkins (three-footed cooking pots), butter pots, carved gorges (a pitcher-like vessel), plain and marked tankards, sprig-decorated mugs, pitchers, and tea equipage (the latter being quite rare).

In Chapter 4, "'Some of the Finer Kinds': English White Stoneware, Part I" "Some of the Finer Kinds" (pp. 93-133, 44 illustrations, 35 figures, 118 endnotes), the authors review the production of 18th-century white salt-glazed stoneware, notably the firms of Josiah Wedgwood, and John Dwight, and manufacture in Staffordshire. This stoneware is notable at Williamsburg in a variety of forms: mugs, tankards, pitchers, and tea and coffee-related vessels (teapots, cups, and saucers). Scratch blue decoration, plaster or Paris molds, slip casting, enameling, and the production of drab ware are also documented. This topic continues in Chapter 5, "'Some of the Finer Kinds': English White Stoneware, Part II" (pp. 134-167, 38 illustrations, 33 figures, 97 endnotes). The use of estate inventories and public advertising are reviewed, as is the use of press-molding and transfer printing. Among the vessel types documented are "Prussian" plates, potted meat dishes, strainers, colanders, porringers, soup tureens, specialized dishes (pickle leaf, sweetmeat, fruit, and salt vessels), mustard pots, ointment pots, scent bottles, candlesticks, miniatures, figures (figurines), wall pockets, and the ubiquitous chamber pots.

Chapter 6, "The Scottish Connection: The Evidence of Scottish Stoneware" (pp. 168-183, 13 illustrations, 11 figures, 45 endnotes), begins with the question: Did potteries in Scotland make white salt-glazed stoneware for export to America? Employing advertisements, commercial records, and the production of plates, bowls, and punch bowls at Delftfield (including a study of kilns and kiln furniture), the authors conclude that the answer is "likely." In the final essay, Chapter 7, "Imitation and Independence: American Stoneware" (pp. 184-221, 51 illustrations, 40 figures, 101 endnotes), Skerry and Hood discuss the distinctions between earthenware and stoneware clays, the Raritan Formation – the main clay source (located in New Jersey, New York and Pennsylvania), and production centers in Yorktown, Virginia; Manhattan, New York; Cheesequake, New Jersey, Boston, Massachusetts, and Savannah, Georgia. They also discuss kiln sites and the use of saggars. The products include bowls, tankards, mugs, jugs, flasks, pipkins, storage jars, batter pitchers, tea canisters, cream jugs, coffee pots, flower pots, chamber pots, and inkwells.

Appendix A, "White Salt-glazed Stoneware Plate Patterns" by Angela Ruth Kuettner (pp. 226-239, 47 illustrations), is a

pictorial glossary of molded decorations found on plates; of the 48 distinct borders, 29 are found at Colonial Williamsburg. Appendix B, "Identification of White Salt-glazed Stoneware Shards Using Non-destructive, Energy-Dispersive, X-Ray Fluorescence Analysis (XRF)" by Helen Stockman-Todd (pp. 240-243, 2 tables), provides data from a general analysis using a portable, hand-held XRF. A dozen "shards" from each of three sites were analyzed three times using three different loci on each specimen; data on 11 elements are presented as percentages. The sherds are from three sites: Prestonpans, Scotland; Fenton, Stoke-on-Trent, Staffordshire, England; and Williamsburg, Virginia. Three specimens of kiln furniture each from Prestonpans and Fenton were also similarly analyzed. The Scottish sherds are less dense than the Staffordshire specimens and there is a "modest difference" between the samples from Scotland, England, and Williamsburg. Stockman-Todd states that the study "is a first step toward linking sherds from Virginia with British potteries" (p. 243). Appendix C "American Stoneware Potters Prior to 1800" by William B. Liebeknecht (pp. 244-247) a tabulation 81 potters from 12 states (CT = 14, GA = 1, MD = 2, MA = 11, NH = 1, NJ = 12, NY = 25, NC = 2, PA = 3, RI = 5, SC = 2, and VA = 3) for the period 1685-1837.

The book's broad scope will appeal to specialists and non-specialists and makes *Salt-glazed Stoneware in Early America* an important reference for curators, collectors, and archaeologists. Using art historical and archaeological analyses, the volume provides a new benchmark for the study of other colonial American ceramics and shows that the continued use of archaeometric techniques would be especially useful in determining provenance. There is a related exhibition of more than 300 intact objects and archaeological specimens from more than 45 public and private collections. The exhibition opened 30 May 2009 and runs through 2 January 211 at the DeWitt Wallace Decorative arts Museum at Colonial Williamsburg. A conference entitled "Pottery with a Past: A New Look at Salt-glazed Stoneware Collections, Research, and Archaeology" is scheduled 18-21 March 2010 at Williamsburg, Virginia; see Forthcoming Meetings for details.

Archaeology, History, and Science: Integrating Approaches to Ancient Materials. Marcos Martín-Torres and Thilo Rehren (eds.). Left Coast Press, Walnut Creek, CA: 2008. Publications of the Institute of Archaeology, University College London. 218 pp. Price US\$69.00 (cloth – ISBN: 978-1-59874-340-1; US\$34.95 (paper - ISBN 978-1-59874-350-0)). This edited volume is composed of ten papers from a conference held at the University College London in 2001. Martín-Torres is Lecturer in Archaeological Science and Material Culture at the Institute of Archaeology, University College London. With degrees in history, archaeology and archaeological science, he has a special interest in the integration of different research approaches to past materials and technologies, and the way in which these inform about human theories, perceptions and actions. Most of his research has focused on medieval and post-medieval metallurgy and crucible technology, with a strong emphasis on the study of alchemical and metallurgical laboratories, and the processing of noble metals. Rehren is Professor of Archaeological Materials and Technologies at the Institute of Archaeology, University

College London. His academic background includes a first degree and Ph.D. in mineralogy and petrology, and a habilitation in archaeometallurgy. He is particularly interested in reconstructing high-temperature production processes for metals and glass, and the interplay between natural, system-driven aspects of technology and the role of human choice and activity in mastering past technologies. Rehren has worked extensively on a range of metals, specifically lead and silver smelting, silver refining, crucible technology, Islamic crucible steel production, Roman zinc and Roman and medieval brass making, and early platinum, tin and tungsten production. He is editor of the *Journal of Archaeological Science*, and immediate past president of the Society for Archaeological Sciences.

Archaeological studies sometimes provide critical consideration of how historical, archaeological, and scientific data relate to each other, or explicit attempts at demonstrating successful strategies for these kinds of interdisciplinary research. The ten papers in this volume provide critical perspectives, examining materials from a wide range of cultures and time periods to demonstrate the added value of combining in their research seemingly incompatible or even contradictory sources. The case studies include explorations of the symbolism of flint knives in ancient Egypt, the meaning of cuneiform glass texts, medieval metallurgical traditions, and urban archaeology at industrial sites. Each chapter has an abstract and its own set of references. I shall briefly review five of the ten chapters because they concern ceramic materials.

Andrew J. Shorthand's "Cuneiform glass texts: a question of meaning" (pp. 61-75. 4 figures, 15 references) contribution focuses on clay tablets from Nineveh (Mesopotamia) during the reign of King Assurbanipal (668-627 BCE) recovered by Sir Henry Layard. Examining the cuneiform texts for evidence about glassmaking technologies and frits, Shorthand discusses the ritual and practical evidence for a multistage production process and suggests that Egyptian frits from Amarna, Egypt were likely similar. Sally-Ann Ashton's chapter "Ptolemaic and Roman Memphis as a production centre" (pp. 101-115, 9 figures, 21 references) is a reassessment of 1st century CE materials from Sir Flinders Petrie's excavations at Memphis, Egypt. Terracotta and faience artifacts, a faience factory, the use of plaster molds during Ptolemaic times are reviewed as is terracotta and bronze figurine production during the early Roman Imperial period. In "Medieval precious metal refining: archaeology and contemporary texts compared" (pp. 131-150, 12 figures, 29 references), Justine Bayley considers cupellation, assaying, and salt and acid parting (e.g., separating gold from silver and silver from lead) as seen in small scale refining using ceramic crucibles. Medieval texts (notably *De diversis artibus* and *De re metallica*) and chemical and mineralogical analyses figure in this evaluation. Josefina Pérez-Arantegui and Carlos Pardo present a fine paper on "Lustre recipes for hispano-moresque ceramic decoration in Muel (Aragón, Spain), or 'how much a little copper weighs'" (pp. 151-166. 2 figures, 3 tables, 20 references). The authors examine 9th century CE Middle Eastern lustre ceramics manufacturing recipes originally kept secret by craft guilds. The complex process including the technical sequence of production is reviewed and focuses on a 16th century recipe from Muel (Zaragoza), Spain that is

compared to archaeological specimens. Thilo Rehren and Marcos Martín-Torres wrote “*Naturam ars imitata: European brassmaking between craft and science*” (pp. 167-188, 2 figures, 56 references) that employs German ceramic crucibles. Here, the authors successfully combine archaeological, scientific, and historical evidence by comparing textual sources as well as the evolution of increasing skill sets and the efficiency of the craftspersons. These are lively and thoughtful essays of interest to a variety of *SAS Bulletin* readers.

From Mine to Microscope: Advances in the Study of Ancient Technology, Andrew J. Shortland, Ian C. Freestone, and Thilo Rehren (eds.). Oxbow Books, Oxford: 2009. xvi + 230 pp. Price US\$120.00. ISBN: 978-1-84217-259-9. These twenty case studies are dedicated to Mike Tite and focus upon the interpretation of ancient artifacts and technologies, particularly through the application of materials science analysis. Instruments ranging from the human eye to mass spectrometry provide insights into a range of technologies ranging from classical alum extraction to Bronze Age wall painting, and cover materials as diverse as niello, flint, bronze, glass and ceramic. The papers range chronologically from the Neolithic through to the medieval period, and geographically from Britain to China, providing an overview which will be of value to anyone interested in early material culture. The obligatory “Introduction” is followed by an “Apology” for the lateness of this publication. There is a very informative “M. S. Tite Bibliography” covering his publications from 1961 through 2009 (pp. xi-xvi) which covers five decades of publications by Mike Tite. There are 161 entries for the period 1961 through 2009 of which 93 (58%) concern ceramics -- pottery, frits, glazes, crucibles or refractories. In no decade are there fewer than ten Mike Tite-authored publications on ceramics, with a high of 25 in the 1990s. Each of the subsequent chapters has an abstract and its own set of references. Eight of the 20 chapters have ceramic content and I shall focus only on these.

J. Molera, T. Pradell, N. Salvadó and M. Vendrill-Saz in “Lead in frits in Islamic and Hispano-Moresque glazed productions” (pp. 1-10, 5 figures, 4 tables, 5 endnotes, 28 references) consider frits and related materials recovered from an Islamic workshop, San Nicolás (Murcia), dated to the 10th century CE and a Hispano-Moresque workshop, Paterna (Valencia), dated to the 13th century CE. The archaeological evidence is compared and contrasted with the raw materials assessments. The Paterna frits correspond to the production of tin glazes (the use of frits in lead glazes being discarded), while the Murcia frits relate to the production of transparent lead and “cuerda seca” glazes, although the frits were also used in tin glaze production. Y. Maniatis contributed “The emergence of ceramic technology and its evolution as revealed with the use of scientific techniques” (pp. 11-27, 18 figures, 2 tables, 1 endnote, 52 references) which provides an overview of 9000-years of ceramic manufacture, the first technological revolution in human history. He believes that the combination of two long-existing independent experiences, the pyrotechnology for burning limestone, and the molding of raw clay resulted in the evolution of ceramics. Maniatis gives an account of how our understanding

of ancient ceramic technology developed with early attempts by potters to produce the desired colors for the vessel and its decorations and concludes with the ingenious manipulation of material, firing atmospheres and temperatures, to produce the black and red glosses in the Classical period.

M. Maggetti’s “Neolithic pottery from Switzerland: Raw materials and manufacturing process” (pp. 29-42, 8 figures, 4 tables, 1 endnote, 51 references) essay concerns pottery from 12 Swiss sites that was made from silicate, fatty clay, which contrasts with clayey objects produced from local, mainly carbonate clays that were either untempered or used organic temper. Other Swiss Neolithic pottery was made using gneiss temper and granitoid rock. The oldest pottery (5250 BCE) is gneiss tempered while the period 3750-1800 BCE has pottery containing, in the main, amphibolite. Open firing resulted in temperature ranges of 500-700°. The casting of crucibles for smelting sulphide ores is also reviewed. R. B. J. Mason contributed a chapter entitled “Low-tech in Amalfi: Provenance and date assignment of medieval Middle-Eastern pottery by application of eyeball technique” (pp. 43-50, 6 figures, 1 table, 1 endnote, 17 references) in which he discusses the analysis of glazed pottery fragments used as tesserae. The scientific equipment employed included his eyes and a 10x hand-lens to discern aspects of the provenance and technology of pottery from the Islamic world. “Some implications of the use of wood ash in Chinese stoneware glazes of the 9th-12th centuries (pp. 51-59, 6 tables, 8 endnotes, 38 references) by N. Wood concerns the ancient and long running (1500 BCE – CE 1200) South China ash-glazed stoneware tradition. The original glaze recipes appear to have used ca. 30-50 wt% of dry calcareous wood ash. Calculating how much ash would be needed for glazes, the author contends that this was far more than could have been provided by ash recovered from kiln firings. Therefore, much of the glaze-ash was especially prepared thereby adding to societal fuel demands and accelerating deforestation.

J. Pérez-Arantegui, J. Ortega, and C. Escriche’s “The Hispano-Moresque tin-glazed ceramics produced in Teruel, Spain: A technology between two historical periods, 13th to 16th c. AD” (pp. 61-67, 6 figures, 1 table, 2 endnotes, 14 references) reviews Teruel’s tin-glaze ceramics decorated with green and brown designs (Middle Ages to the present) and blue decorations (15th century to the present). The authors characterize the chemical composition and textural ceramic properties of the pottery, noting some features such as cassiterite size and crystal distribution, homogeneity or heterogeneity and the presence or absence of temper inclusions which helps distinguish these wares from other productions. A. P. Middleton in “Beads beyond number: Faience from the ‘Isis Tomb’ at Vulci, Italy” (pp. 69-78, 8 figures, 4 tables, 1 endnote, 22 references) employs binocular microscopy and an SEM equipped with an energy dispersive X-ray analyzer to examine artifacts (glass and beads) and raw materials from the Vulci tomb excavated in the 19th century. He demonstrates that the raw materials and objects and the methods of manufacture are consistent with contemporary production in Egypt. S. Paynter’s paper, “Links between glazes and glass in mid-2nd millennium CE Mesopotamia and Egypt” (pp. 93-108, 9 figures, 7 tables, 1 endnote, 57 references), presents the results of an investigation of the origins of glazing technology for clay-

based ceramics. Glaze compositions for 14th century BCE Nuzi, Mesopotamia, were similar to contemporary glass. Slight compositional differences between glazes and glass are attributed to the influence of waste gases from the wood used to fire the pottery kilns. This suggests that the technology for glazing ceramics in the Near East evolved from the glass industry. Technological reasons for the absence of glazed clay artifacts in Egypt before the 1st century BCE are examined and discounted, and other explanations are postulated.

The contributions in this festschrift honor the collegiality and mentorship of Michael Tite, recipient of the Archaeological Institute of America's 2008 Pomerance Award for Scientific Contributions to Archaeology who recently "retired" from the Oxford University's Research Laboratory for Archaeology and the History of Art and who served as the long-time editor of the journal *Archaeometry*. The diversity of topics and scientific methods utilized in these papers attest to Tite's influence in integrating science and archaeology, and the volume stands as a splendid tribute to a scholar and gentleman.

From Santa Elena to St. Augustine: Indigenous Ceramic Variability (A.D. 1400-1700) Kathleen A. Deagan and David Hurst Thomas (eds.). The American Museum of Natural History Anthropological Paper 90, New York: 2009. 229 pp., 77 figures, 42 tables. ISSN: 0065-9452. Available online gratis: <http://digitallibrary.amnh.org/dspace/handle/2246/5987>; hardcopy available from the AMNH. This volume constitutes the proceedings of the Second Caldwell Conference held at St. Catherines Island, Georgia, from 30 March to 1 April 2007. The front material includes the "Table of Contents" (pp. 3-5); lists of tables and figures (pp. 5-7) which includes radiometric dates; "Abstract" (p. 8); "Participants in the Second Caldwell Conference" n = 16 (p. 9); "Preface" by Kathleen Deagan and David Hurst Thomas (pp. 11-13); and "Acknowledgments." There is a conflated set of "References", n = 364 (pp. 213-229). Ten of the 16 presenters have contributed to the volume. The volume is divided into three parts with a total of eight chapters of varying lengths.

Important changes took place in aboriginal ceramic assemblages of the northern Florida, Georgia, and South Carolina coast after the arrival of Europeans. New pottery designs emerged and aboriginal demographics became fluid. Catastrophic population loss occurred in some places, new groups formed in others, and movements of people occurred nearly everywhere. Although culturally and linguistically diverse, the native inhabitants of this region shared the unwelcome encounter with Spanish people and colonial institutions, beginning in the early decades of the 16th century and continuing into the 18th century. Spanish missions and military outposts were established at native communities throughout the area, and these sites have been studied by both archaeologists and historians for decades. As a consequence, the lower southeastern Atlantic coast offers one of the most intensively studied episodes of multicultural colonial engagement in America. The scope of conference was restricted to late prehistoric and early historic (A.D. 1400-1700) aboriginal ceramic wares from Santa Elena (South Carolina) to St. Augustine (Florida). The primary objective was to more

precisely establish the technology, form, and design of the archaeological ceramic evidence. Without devolving into semantic and/or taxonomic wrangles, conferees examined how well (or poorly) archaeological labels used throughout the region to identify pottery serve as reliable proxies for the physical examples of those ceramic traditions. They also attempted to define the time-space distribution of the various ceramic traditions and pottery types throughout the south Atlantic coast. Specifically, the participants asked: 1) Did the indigenous ceramic complexes change fundamentally with the arrival of the Spaniards? 2) Or did indigenous ceramic traditions essentially persist, and merely shifted geographically? The eight chapters in this volume examine, on a case-by-case basis, the most important aboriginal ceramic assemblages from Santa Elena southward to St. Augustine, across the region, contextualizing each assemblage with the relevant physical stratigraphy, radiocarbon dates, associations with Euro-American wares, and documentary evidence.

Part I: Ceramic Variability along the South Carolina-Georgia Coastline (four chapters): "Chapter 1. Irene and Altamaha Ceramics from the Charlesfort / Santa Elena Site, Parris Island, South Carolina" by Chester B. DePratter (pp. 19-47, 4 tables, 1 note, and 22 figures [13 are color]). This essay covers the history of the excavation; defines the Irene Ceramic Complex, the Altamaha and San Marcos Ceramic Complex; designates the type/series names; documents the Santa Elena sample; and reports the typological analysis and vessel forms. "Chapter 2. Late Aboriginal Ceramics from St. Catherines Island (cal A.D. 1400-1700)" by David Hurst Thomas (pp. 49-81, 4 tables, 16 notes, and 19 figures [12 are color]). The author considers the archaeology of St. Catherines Island, the aboriginal ceramics assemblages from St. Catherines Island, and discusses methodologies (classifying the ceramic assemblages and comparing the ceramic and radiocarbon chronologies). Irene period and Altamaha period ceramics and the ceramic and radiocarbon evidence are reviewed and the Mission Santa Catalina de Guale (churches, friary, and mission) are considered along with radiocarbon data. Lastly, the temporal span of Altamaha period ceramics and the possibility that the Guale people are descended directly from the Late Prehistoric Irene population are evaluated. "Chapter 3. Stability and Ubiquity: Irene, Altamaha, and San Marcos Pottery in Time and Space" by Rebecca Saunders (pp. 83-111, 18 tables, 14 notes, 4 figures [all b-w]). Saunders discusses the historical and archaeological contexts, the assemblages, methods (including cluster analysis), and the Meeting House field terminal dates and two missions (Mission Santa Catalina, Georgia and Mission Santa Catalina, Florida). There is a table of C14 dates but no illustrations of pottery. "Chapter 4. Indian Ceramics of the Spanish Atlantic Coast: the View from the Interior of Georgia and South Carolina" by Mark Williams (pp. 113-121, 5 figures [all b-w]). Williams writes about "Square Ground" Lamar and native ceramics, Piedmont Oconee Lamar sites, probable demographic shifts and interior impacts on the coast.

Part II: Ceramic Variability Along the Northeastern Florida Coastline (three chapters): "Chapter 5. Straddling the Florida-Georgia State Line: Ceramic Chronology of the St. Marys

Region (ca. A.D. 1400–1700)” by Keith H. Ashley (pp. 125–139, 1 table, 1 note, 5 figures [3 are color]). Ashley writes about St. Marys II period (ca. A.D. 1100–1450), the pottery and other material culture, and settlement and subsistence, the turns to the San Pedro period (ca. A.D. 1450–1625), its pottery and temporal placement, site distributions and the Altamaha / San Marcos period (ca. A.D. 1625–1702). There is also a table of radiocarbon dates. “Chapter 6. Native American Ceramics at the Fountain of Youth Park Site, St. Augustine (8-SJ-31)” by Kathleen Deagan (pp. 141–164, 4 tables, 8 figures [7 are color]). She reviews cultural and historical associations, archaeological contexts, and taphonomy and periodicity before turning to Native American ceramics: St. Johns Tradition, San Pedro (Grog-Tempered) Tradition, Irene/Altamaha/San Marcos Tradition, and Undefined/Unidentified Wares. a table presents the radiocarbon dates. “Chapter 7. Aboriginal Ceramics at Three 18th-Century Mission Sites in St. Augustine, Florida” by Gifford J. Waters (pp. 165–176, 4 tables, 11 figures [all b-w]). Waters considers the topic of ceramics and identity then turns to the historical background of 18th-century St. Augustine, and ceramic assemblages in 18th-century Mission sites: Nombre de Dios, La Punta, and Pocotlaca.

Part III: Defining the “Who” behind the Ceramics (one chapter and an epilogue): “Chapter 8. Ethnicity and Ceramics on the Southeastern Atlantic Coast: an Ethnohistorical Analysis” by John E. Worth (pp. 179–207, 7 tables, 3 figures [2 are color]). Worth considers historical and archaeological context, initial contacts (1514–1526), Spanish reconnaissance and French fortification (1562–1565), Spanish fortification (1565–1569), Spanish contraction at St. Augustine and Santa Elena (1569–1587), St. Augustine and the Franciscan Mission period, beyond the mission frontier (Escamaçu), retreat and abandonment, spatial and temporal patterns, and ethnicity and ceramics, and “steps toward a synthesis.” In the “Epilogue,” Deagan and Hurst Thomas (pp. 209–212) summarize issues of classification, chronology, and diversity, problematic history, ceramics and identity, and social engagement.

The Second Caldwell Conference was organized to bring researchers working in South Carolina, Georgia, and Florida together to address and more precisely define aboriginal ceramic change throughout the region as a baseline for approaching a more broadly based anthropological perspective on the consequences of encounter. This was a significant conference and the papers were expertly edited and published rather quickly. The inclusion of 39 color illustrations (mostly of ceramics) was extremely valuable for clarity.

Asia and Spanish America: Trans-Pacific Artistic and Cultural Exchange, 1500-1850: Papers from the 2006 Mayer Center Symposium at the Denver Art Museum. Donna Pierce and Ronald Otsuka (eds.). Denver Art Museum, Denver (distributed by the University of Oklahoma Press): 2009. Price US\$39.95 (paper). ISBN: 978-0-8061-9972-3. This volume contains the papers from the 2006 Mater Center Symposium at the Denver Art Museum and is s publication of the Frederick and Jan Mayer Center for Pre-Columbian and Spanish Colonial art at the Denver Art Museum. Four contributions contain information about ceramics. “Perception of the Other and the Language of

‘Chinese Mimicry’ un the Decorative Arts of New Spain” by Gustavo Curiel (pp. 19–36); “Early Manila Galleon Trade: Merchants’ Networks and Market in 16th- and 17th-Century Mexico” by Etsuko Miyata Rodríguez (pp. 37–57); “Shipwreck Evidence for the China-Manila Ceramics Trade” by Roxanna M. Brown (pp. 59–68); and “Chinese Porcelain in the Viceroyalty of Peru: by George Kuwayana (pp. 165–174).

The Ming Gap and Shipwreck Ceramics in Southeast Asia: Towards a Chronology of the Thai Trade Ware Roxanna Maude Brown. (Eileen Deeley, Beatrix Latham, and Karl E. Weber, eds.). The Siam Society Under Royal Patronage, Bangkok (distributed by River Books Co. Ltd.): 2009. 212 pp., 73 plates (with 295 color illustrations), 50 tables, 8 drawings, bibliography, indices. Available through online booksellers below the advertized price of US\$50.00, €40.40, or £30.00. ISBN: 978 974 9863 77 0, 759. See also Riverbooks, Bangkok, Thailand: http://www.riverbooksbk.com/books/catalog/product_info.php?products_id=208&osCsid=cc250c2ffdce7568770af718a604e92e . The focus of the dissertation is her discussion of 35 kiln sites and 120 shipwrecks that yielded ceramics. There is a “Foreword” by Athuek Asvanund, President of the Royal Siam Society (p. 6); “Editors’ Notes” (pp. 7–8); “Preface” by Robert L. Brown (Department of Art History, University of California at Los Angeles) (pp. 8–9); “Acknowledgments” by Roxanna Brown (from her dissertation) (p. 10); her “Vita” [sic.] (p. 11); a photomontage 1946–2008 [45 total images] (pp. 12–13); and a tabulation of her “Publications” (1973–2008) (pp. 14–15). Seven narrative chapters from her dissertation are reproduced (pp. 17–81) that include a color map of shipwreck and kiln site locations in Southeast Asia, 60 color illustrations, and 199 scholarly notes. Seventy-three color plates (listed on p. 82) incorporate 327 color images of vessels (pp. 82–159) and are grouped together as are all of the dissertation tables [n = 30] (pp. 161–187). There is a “Bibliography” with 558 entries (pp. 188–203). The color images are accompanied by verbal descriptions and vessel dimensions and the text has notes within sidebars. A three-page triple-column “Index” (pp. 204–206) contains proper nouns and subjects. The five primary chapters are: “Emerging Evidence of submerged Treasurers” (pp. 17–22, 21 notes, 1 color illustration), “Evolution of the Term ‘Ming Gap’” (pp. 23–32, 40 notes, 4 color illustrations), “Shipwreck Excavations: Data Base and Methodology with Focus on the 15th Century (pp. 33–50, 78 notes, 12 color illustrations), “Chronology of the Thai Trade Wares” (pp. 51–68, 55 notes, 38 color illustrations), and “Summary and Prospects for the Future” (pp. 69–75, 5 notes, 4 color illustrations). Chapter 6 is “Epilogue by Jaime Taweessin Ngerntongdee [Roxanna’s son, a graduate of Kasetsart University, Bangkok] (pp. 76–77 1 color illustration) and Chapter 7 is “Ceramic Provenance and Categories: An Inventory” (pp. 78–81) which precedes the color plates. The Table of Contents has four pagination errors (Chapters 6 and 7, Tables, and Index) but these do not detract from this splendid assessment of the Ming Gap and the superb color illustrations. Roxanna would be pleased.

Continuity and Change in a Domestic Industry: Santa María Atzompa, a Pottery Making Town in Oaxaca, Mexico. Mary Stevenson Thieme, Fieldiana: Anthropology New Series

No. 41. The Field Museum of Natural History, Chicago. Abstract: The potters of Santa María Atzompa, a town in the Valley of Oaxaca in southern Mexico, have been making pottery for at least 500 years, and the town has been widely known for its production of green lead-glazed cookware and ornamental pottery. This study, conducted in the 1990s, examines how Atzompa pottery production changed since studies made in the 1950s and 1960s. Beginning in the mid-1990s, to a large extent as a result of public concern, publicity, and legislation about the lead glaze, the potters changed the style, distribution, and social context of their ceramic production. Also considered are the dynamics of household production and the choices that the potters made. A third element of the study is the compositional analysis of the various ceramic materials and pastes used by the potters. The full text, tables, and illustrations are available online at: <http://www.bioone.org/doi/abs/10.3158/41.1>

Previous Meetings

The Art of Teotihuacan and its Sphere of Influence was a conference and workshop on Teotihuacan ceramics and figurines organized by Margaret Young-Sánchez (Denver Art Museum) and Annabeth Headrick (University of Denver) that was sponsored by the Mayer Center and the Denver Art Museum and held at the Denver Art Museum from 7-8 November 2009. The speakers included: Saburo Sugiyama (Aichi Prefectural University, Japan) "Cosmology, Militarism, and Polity Materialized at the Major Monuments in Teotihuacan"; Matthew Robb (St. Louis Museum of Art) "The Torch and the Shield: Architectural and Iconographic Continuities at the Palace of Quetzalpapalotl"; Charles C. Kolb (National Endowment for the Humanities) "Classic Teotihuacan Period Ceramic Production"; Annabeth Headrick (University of Denver) "Mass Production in a Preindustrial Age: Individuality and Ideology in Teotihuacan's Censers"; George Cowgill (Arizona State University, Tempe) "Nose Pendants: Signs of Rank and Office in the Political System of Teotihuacan?"; Karl Taube (University of California, San Diego) "Teotihuacan and the Ceramic Art of Escuintla, Guatemala: Iconography and Cosmology in Early Classic Mesoamerica"; and James Langley (Canadian Society for Mesoamerican Studies) "A Distant Prospect of Teotihuacan." Sunday's very successful three-hour "hands-on" workshop involved a show and tell on figurines and vessels from the museum's collections which were assembled in a conference room so that the symposiasts and members of the audience could handle (with white cotton gloves) and discuss the individual objects. Hand- and mold made figurines, theater-type censers, painted ceramics, fresco-painted vessels, Thin Orange ware, champlévé decorated tripod vases, etc. Warren Barbour (State University of New York at Buffalo) was unable to attend and give his paper "Host Figurines and the Social Order of Teotihuacan: Soldiers, Traders, Diviners and Peasants." The papers are to be published by the Denver Art Museum.

American Anthropological Association Annual Meeting, 2-6 December 2009, held in Philadelphia, PA, USA. There were eight papers on ceramic materials in addition to the annual Ceramic Ecology symposium. The former group included

presentations by Jason R. Kennedy "Commensality and Labor at Yenice Yani 1, Southeastern Turkey: A Use-alteration Analysis of Terminal Ubaid Ceramics"; Sue Ann McCarty (University of Virginia) "The Feast of Sacrifice: Interhousehold Variability and Pastoralism at Kazane Höyük, A Pottery Neolithic Settlement in Southeastern Turkey"; Gulong Lai (University of Florida) "Colors and Color Symbolism in Early Chinese Ritual Art"; Warren DeBoer (Queens College, CUNY) "Eating and Drinking Colors in Western Amazonia"; Rita P. Wright (New York University) "Signature Design: Technical Mastery and Creative Artistry in Ancient Pottery" [Indus Valley]; Laura Junker and Ekaterina Khramtsova (both University of Illinois at Chicago) "Ceramic Evidence for Variation in Feasting Patterns in the Lowland and Upland societies of the 15th-16th Centuries Philippines"; Lindsay R. Clark and Andrew Duff (both Washington State University) "Examining Social Interaction within a Chacoan Community through Ceramic Stylistic Variation"; and Maria E. Raviele (Michigan State University) "Assessment of Maize Phytolith Taphonomy through Experimental and Archaeological Residues." "Ceramic Ecology XXIII: Current Research on Ceramics 2009" was an annual symposium organized and chaired by Charles C. Kolb. The following papers were presented: Charles C. Kolb (National Endowment for the Humanities) "Introduction to Ceramic Ecology XXIII: Current Research on Ceramics 2009." Rahul C. Oka (University of Notre Dame), Chapurukha M. Kusimba (Field Museum of Natural History) Laure Dussubieux (Field Museum of Natural History), Vishwas Gogte (Deccan College Post-Graduate and Research Institute Pune, India), and Kuldeep Bhan (Maharaja Sayajirao University of Vadodara Baroda, India) "Producing and Exporting 'South Asian; Islamic Monochrome Glazed Wares: Import Substitution and Market Capture in the 16th and 17th centuries CE." John W. Arthur (University of South Florida, St. Petersburg) "Pottery and Castes Groups: Historical Archaeology of the Gamo Highlands of Southern Ethiopia." Jerolyn E. Morrison (University of Leicester) "Must Haves for the Minoan Kitchen, a Tripod Cooking Pot and a Cooking Dish." Jill Bierly (University of Massachusetts at Amherst) "Idalion: Ceramics and Identity at an Iron Age Border Town in Cyprus." James M. Skibo (Illinois State University), Mary E. Malainey (Brandon University), and Eric C. Drake (Hiawatha National Forest) "Stone Boiling, Fire-Cracked Rock, and Nut Oil: Exploring the Origins of Pottery Making in the Upper Great Lakes." Aleksandra Wierucka (University of Gdansk, Poland) "The Disappearing Art: The Ceramics of Quichua along the Napo River." Amy Hirshman (West Virginia University) "Petrographic Analysis of Paste Variability in Tarascan Fine Ware Ceramics: a Preliminary Assessment." Sandra L. López Varela (Universidad Autonoma del Estado de Morelos) "Institutional Imagining of Development: New Inquiry Field for Ethnoarchaeology." Jim Weil (Science Museum of Minnesota) "Archaeological and Ethnohistorical Inferences Based on the Manufacture of Three Ceramic Pieces by Contemporary Artisans on Costa Rica's Nicoya Peninsula." Charles C. Kolb (National Endowment for the Humanities) "From the Field and Laboratory: Current Research in Ceramic Studies." Christopher Pool (University of Kentucky) served as Discussant.

Archaeological Institute of America annual meeting, 6-9 January 2010, was held in Anaheim, California, USA. Papers oriented to ceramics included: "Fine Pottery in Rome in the Middle Republican Age: Cultural Patterns, Production Systems, and Socio-Economic Dynamics in the Age of Conquest" by Antonio F. Ferrandes, Sapienza (University of Rome); "Which Markets did the Thera Merchants Prefer for Exchanging Commodities? Imported Late Bronze Age Pottery from Akrotiri" by Demetra Kriga (College Year in Athens); "Cretan Wine in the Later Roman Empire" by Scott Gallimore (University at Buffalo, SUNY); "From East to West: Corinthian Trade in the Hellenistic Period" by Sarah James (The University of Texas, Austin); "Wine for Bread: Food, Drink, and Coexistence at the Periphery of the Greek World" by Ulrike Krotscheck (Evergreen State University); "Hellenistic Lerna: Gateway Between Argos and Egypt" by Brice Erickson (University of California at Santa Barbara); "Tales from Inside the Grave: A Re-Evaluation of Funerary Practices in Hellenistic Syria" by Lidewijde de Jong (University of North Carolina, Chapel Hill); and "The Iconography of Empire: Figurines from Tell al- Juidaidah" by Sarah Hawley (University of Southern California). Seven papers were presented in a session on "Greek Pottery Studies": "Clubfooted Cypselids: Using Padded Dancers to Examine Local Identity in Archaic Corinth" by Angela Ziskowski (Bryn Mawr College); "New Archaeometric Evidence for Apulian Red-Figure Production Centers" by Jed M. Thorn (University of Cincinnati); "Aristocracy and the Burlesque in Archaic Greece and Etruria: Arguing for a Koine of Dionysiac Practices" by Amalia Avramidou (Centre de recherches archéologiques, Université libre de Bruxelles); "On the Scale and Organization of the Attic Red-Figure Pottery Industry" by Philip Sapiirstein (University of Pennsylvania); "Archaic and Classical Aryballoi and the Locker-Room Humor of the Greek Gymnasium" by Marina Haworth (Harvard University); "The Art and Archaeology of Dress: Figured Textiles in Greek Vase Painting" by Anthony F. Mangieri (Savannah College of Art and Design); and "Excavations in the Castle of Mytilene" by Hector Williams (University of British Columbia).

The Gold Medal Colloquium, The State and Future of Roman Art, Archaeology, and History featured "Papers in Honor of Papers in Honor of John H. Humphrey" organized by Elaine Gazda (University of Michigan) and Susan Stevens (Randolph College); Michael Bonifay (CNRS): "African Pottery, Field Archaeology and History." Other presentations included: "Workshops in Post-Roman Phases of Villas in Italy" by Beth M. Munro (University of Oxford); "Roman Shipwreck Cargoes: Patterns of Trade in the Mediterranean" by Candace Rice (University of Oxford); "Ceramics from Building A in The Sanctuary of Apollo, at Mandra on Despotiko" by Robert F. Sutton (Indiana University-Purdue University, Indianapolis), Yannis Kourayos (Greek Archaeological Service), and Eleni Hasaki (University of Arizona); and "The Storage and Distribution of Bricks in Second Century Ostia" by Dirk Booms (University of Cambridge).

"*A Trenton Sampler*" annual meeting of the *Archaeological Society of New Jersey* co-hosted by the Trenton Historical Society, 16 January 2010 at the New Jersey State Museum

Auditorium, Trenton, NJ, USA. The following paper was given: "Ceramic Tips and Cherry Pits: Urban Archaeology near Trenton Battle Monument" by Brenda Springsted (Richard Grubb & Associates).

Forthcoming Meetings

The XVII Congreso Nacional de Arqueología Argentina is scheduled to be held in Mendoza, Argentina, 11-15 October 2010. The language of presentation is Spanish. The program is organized as follows: Two mesa redondas, 6 mesa de comunicaciones, 27 symposia, and a poster session are scheduled; Symposia 3 (ceramic production), 16 (technical analyses of pigments and residues), and 27 (physical and chemical analyses) would be of particular interest to readers of this column. For additional information, visit www.xviiicnaa.org.ar to view session abstracts and for contact information about the organizers.

Pottery with a Past: A New Look at Salt-glazed Stoneware Collections, Research, and Archaeology is a conference scheduled 18-21 March 2010 at Williamsburg, Virginia, USA. The conference will explore the production and distribution of brown, gray, and white salt-glazed stoneware from Germany, Britain, and America. The program celebrates the publication of *Salt-glazed Stoneware in Early America* by Janine E. Skerry and Suzanne Findlen Hood, and is timed to coincide with the exhibition "Pottery with a Past: Stoneware in Early America" which is the first museum presentation of German, English, and American stoneware made prior to 1800. The exhibit will be on view at Colonial Williamsburg's DeWitt Wallace Decorative Arts Museum. The exhibition and the conference are made possible through the generosity of the Richard C. von Hess Foundation. Recent new discoveries have brought salt-glazed stoneware to the forefront of current collecting and archaeological research. From first English settlement onward, salt-glazed stoneware filled an important role in colonial homes and public houses. Dynamic trade brought a range of manufactured goods, including stoneware, to the New World. During much of the seventeenth century, stoneware bottles and mugs were prized possessions of the wealthiest colonists. But by the third quarter of the eighteenth century, brown, gray, and white stoneware from Germany and England was found everywhere. At that time, it played a role akin to modern-day plastics: ever present and essential, but rarely celebrated. Stoneware was comparatively affordable, extremely durable, readily available, and—in some instances—quite fashionable. This versatile ceramic also was manufactured successfully in America during the colonial and post-Revolutionary period.

The conference begins on 18 March and includes an optional program at Historic Jamestown (registration is limited). There will be lecture by senior archaeological curator Bly Straube, "Digging Up Dirt on Jamestown: 15 Years of Excavation on America's Birthplace," an in-depth look at the James Fort archaeological site with senior staff archaeologist Jamie May, a behind-the-scenes examination of recent important finds with a specific emphasis on stoneware from the site, and a tour of the Archaearium. The regular program begins with registration and a welcome by Ronald L. Hurst, vice president, collections,

conservation, and museums, and Carlisle H. Humelsine Chief Curator, Colonial Williamsburg). Janine E. Skerry (curator of metals, Colonial Williamsburg) gives the keynote presentation, "The Devil's in the Details, or Stoneware Newly Discovered in Early America," followed by a reception and book signing. Friday's program includes: "The Holy Family at a Meal and Other Stories: The Stoneware Revolution in the Medieval and Pre-industrial World" by David Gaimster (general secretary and CEO, Society of Antiquaries of London), "The Westerwald Stoneware of the Renaissance and the Baroque: Origin and Phases of Its Development" by Gerd Kessler (independent assistant, Westerwald Ceramics Museum and Documentation Center, Höhr-Grenzhausen, Germany), "John Dwight and His Contemporaries" by Jonathan Horne (specialist in early English pottery, Sampson & Horne Antiques, London, England), "Every Sherd Tells a Story -- An Archaeological Perspective on Staffordshire Salt-glazed Stoneware" by David Barker (archaeological consultant and ceramics specialist, Newcastle-under-Lyme, Staffordshire, England), and "Dry-bodied Stoneware for America: Is There Evidence?" by Diana Edwards (independent scholar, Baltimore, Maryland).

Saturday's lectures include: "Barley Corn & Basketwork, Gadroon & Mosaik': Press-moulding and Slip-casting in mid-18th-century England" by Miranda F. Goodby (curator of ceramics, The Potteries Museum and Art Gallery, Hanley, Stoke-on-Trent, England), "Living on the Edge: The Identification of White Salt-glazed Stoneware Plate Patterns" by Angelika R. Kuettner (associate registrar for collections documentation and imaging, Colonial Williamsburg), "Picking Up the Pieces: An Archaeological Perspective on Stoneware from Two Williamsburg Households" by Meredith M. Poole (staff archaeologist, Colonial Williamsburg), "Scottish Stoneware 1750-1875: Acorn to Oak Tree" by George Haggarty (archaeologist and research associate, National Museums Scotland, Edinburgh, Scotland), "Zapping Electrons: The Scientific Study of Stoneware Objects" by David Blanchfield (conservator of objects and metals) and Helen Stockman-Todd (associate conservator of objects, Colonial Williamsburg), "The Birth of America's Stone(ware) Age: William Rogers of Yorktown" by Robert Hunter (editor, *Ceramics in America*, Williamsburg, Virginia), "New Jersey's Role in 18th-century American Stoneware Production" by William B. Liebeknech (archaeological principal investigator, Hunter Research Inc., Trenton, New Jersey), and "American Stoneware: Adaptation and Imitation" by Suzanne Findlen Hood (associate curator of ceramics and glass, Colonial Williamsburg). On Sunday, 21 March, there is another optional program (registration is limited) focusing on the Colonial Williamsburg archaeological collections and William Rogers kiln site. Kelly Ladd-Kostro (associate curator of archaeological collections, Colonial Williamsburg) leads a behind-the-scenes tour focusing on stoneware and recent excavations which will be followed by a trip to Yorktown for a detailed look at excavated vessels and the kiln site of the first stoneware potter in America, William Rogers, guided by David Riggs (collection curator, Colonial National Historical Park, Yorktown) and Rob Hunter (editor, *Ceramics in America*).

Registration fees are US\$250 (plus US\$60 for each of the two optional programs). For information of fees and room reservations, please visit: www.history.org/conted; telephone 1-800-603-0948; Fax (757) 565-8921; mail Office of Conferences, Forums, and Workshops The Colonial Williamsburg Foundation, Post Office Box 1776, Williamsburg, VA 23187-1776, USA.

Exhibition

Virtual Vault <http://www.statemuseum.arizona.edu/exhibits/pproj/index.asp>. Modern computer technology allows the museum to share ancient pottery technology on a global scale, serving both researchers and general public. On 10 May 2008 Arizona State Museum (ASM) opened its newest exhibition, "The Pottery Project." With some 20,000 whole vessels, ASM's collection of Southwest Indian pottery is the world's largest and most comprehensively documented. A feature of the exhibition is the Virtual Vault, a three-dimensional, interactive database of signature pieces from within the museum's actual storage vault (The Agnese and Emil Haury Southwest Native Nations Pottery Vault). "For curatorial reasons, the museum cannot allow visitors into the real storage vault, which must stay at a constant 72° F. and 32% Relative humidity," according to Diane Dittmore, an ASM collections curator, "so this is an excellent way for us to share the collection with visitors and with the world." The Virtual Vault will enable visitors to access pieces of their choice "virtually:" to remove a pot from the shelf, rotate it, learn more about the archaeological site where it was found, watch a potter demonstrate how it was made, hear the stories it embodies, hear a curator discuss its cultural significance, and peruse its catalog data. Interpretive components will situate the development of ceramics in the American Southwest within the broader context of current archaeological and ethnographic research. Thus far 140 pots have been digitized. The database has capabilities for continuous additions and upgrades. "This visual database conveys a wealth of interpretive and contextual information not delivered by traditional exhibition mechanisms," explains Davison Koenig, an exhibits curator at ASM. "This globally accessible, three-dimensional database will be as informationally relevant for the hard core researcher as it will be intellectually stimulating for the casual visitor." A professional collaboration between Arizona State Museum and the Center for Desert Archaeology (CDA) is at the core of the Virtual Vault project. CDA's Doug Gann has been investigating applications of profile modeling, an innovative technique enabling rapid, low-cost digitization of three-dimensional objects. This revolutionary method quickly creates photorealistic digital models of objects using photography rather than costly laser scans. Already a pioneer in 3D modeling of archaeological sites, Gann views the nexus between these two techniques as an ideal means of creating past worlds where virtual explorers can view pottery and artifacts in situ. He stated: "I see this project as a prototype for finally unlocking the potential of the 'virtual museum.' Rather than simply displaying pictures of interesting objects, the State Museum is going to be able to share both detailed three-dimensional models and interpretive information on some of the most amazing examples of ancient, historic, and modern

Native American ceramic arts.” This project is supported by Arizona State Museum and the Center for Desert Archaeology. A recent US\$25,000 grant from the National Endowment for the Humanities will allow the museum's virtual vault to be shared with a global audience via the Internet. The award funded the completion of an alpha-level version of the Virtual Vault for testing and evaluation. Private support is needed for subsequent phases and ongoing additions of significant pieces. This link shows the Virtual Vault in action (when the page comes up, wait about 30 seconds for the software to load); note how users can fully manipulate each pot and zoom in: <http://www.cdarc.org/pages/what/current/vv/vv-example-1.html>.

Training Opportunity

Introduction to Ceramic Petrology. (Also posted on the SASnet.) The Fitch Laboratory; known for its ceramic petrology applications and its extensive reference collections of geological and ceramic thin sections, is offering a two-week introductory course on ceramic petrology, 12-13 April 2010, sponsored by the Bradford McConnell Trust. The course is for individuals who have no previous experience on petrology although familiarity on archaeological ceramics would be useful. Master's level or researchers in archaeological materials, as well as for postdoctoral researchers interested in being familiar with ceramic petrology applications are encouraged to apply. Although the focus is primarily with ceramic materials the skills learnt are applicable to the study of lithics, building materials, pigments and soils. The course will comprise daily lectures and practicum's introducing to optical polarizing light microscopy, the identification of main rock-forming minerals, the classification of rock types, the use and interpretation of geological maps and, subsequently, the analysis of ceramic thin sections to reconstruct provenance and technology. A field class to Aegina, including a visit to a traditional pottery workshop, will provide practical experience on prospection for pottery raw materials and sampling, as well as contemporary potting practices. In the second week, each participant will have the opportunity to undertake a case study project. A course manual will be provided for participants covering all aspects of the course and further reading. Course co-coordinators and instructors will be Evangelia Kiriatzi (Director, Fitch Laboratory) and Ruth Siddall (Lecturer, Earth Science, University College London). For further information, please check the relevant sections on the British School at Athens web pages or contact either of the two course coordinators, Evangelia Kiriatzi (fldirector@bsa.ac.uk) or Ruth Siddall (r.siddall@ucl.ac.uk). Applications must include: a brief curriculum vitae, two reference letters and a short covering letter stating the interest in ceramic petrology and reasons for wishing to do the course. Applications should be submitted via e-mail to flsecretary@bsa.ac.uk. The closing date is 31 January 2010. References must also be received by then: it is the applicant's responsibility to ensure that references are sent. The successful candidates will be informed no later than 20 February 2010.

New Journal

Archeomatica is a new cultural heritage technologies journal and has issued a Call for Papers for its quarterly issues in 2010 (see <http://www.archeomatica.it/call-for-papers>). According to the previous link, *Archeomatica* is described as a “new, multidisciplinary journal, printed in Italy, devoted to the presentation and the dissemination of advanced methodologies, emerging technologies and techniques for the knowledge, documentation, safeguard, conservation, and exploitation of cultural heritage. The journal aims to publish papers of significant and lasting value written by scientists, conservators, and archaeologists involved on this field with the diffusion of specific new methodologies and experimental results. *Archeomatica* will also emphasize fruitful discussion on the best up-to-date scientific applications and exchanging ideas and findings related to any aspect of the cultural heritage sector. *Archeomatica* is intended also to be a primary source of multidisciplinary information for the sector of cultural heritage. The journal is divided in three sections *Documentazione* (Survey and documentation), *Rivelazioni* (Analysis, diagnostics and monitoring), and *Restauro* (Materials and intervention techniques). The issues will also be published on line at the website www.archeomatica.it.

“*Archeomatica* invites submissions of high-quality papers and interdisciplinary works for the next issues in all areas related to science and technology in cultural heritage, particularly on recent developments. If you are interested, please submit an original paper to paper-submission@archeomatica.it. The papers will be subject to review by the scientific board after which they are accepted or rejected in order to maintain quality. Applicants will be notified by email as to their acceptance. Topics and trends relevant to the *Archeomatica* include, but are not limited to, the following: methodologies and analytical techniques for the characterization and for the evaluation of the preservation state of historical masterpieces, on-site and remotely sensed data collection, digital artifact capture, archaeological reconstruction and restoration, experiences in cultural heritage conservation, methods for data elaboration and cataloguing, augmentation of physical collections with digital presentations, database and computational interpretation, three-dimensional computer modeling, Second Life and virtual worlds, image capture and processing and interpretation, X-ray imaging and analysis, metadata of material culture, terrestrial laser scanning, virtual reality data acquisition, photogrammetric processing, GPS, GIS, remote sensing, digitization of cultural property, Web 2.0 and development of social networks on the top of cultural heritage portals, applications of mobile technologies for digital culture and cultural heritage, Augmented reality and virtual reality, non-destructive analytical techniques for the study of the composition and decay of cultural heritage components, and management of heritage knowledge and data.”

New Journal (Correction)

Journal of Experimental Pyrotechnologies (Editura Universitatii din Bucuresti) edited by Dragos Gheorghiu and George Nash. Dragos Gheorghiu (National University of Arts)

had pointed out several errors, mostly typographical, in the SAS posting in the *Bulletin* 32(1) (Spring 2009). The journal title is *Journal of Experimental Pyrotechnologies* and does not include the term *Archaeogate*. The source of these mistakes appears to be an Italian Web site which introduced errors from the original table of contents; vis. <http://www.archaeogate.org/sperimentale/rivista/611/journal-of-experimental-archaeology-1-2008-editura-univ.html>. The correct contents includes: Dragos Gheorghiu and George Nash, "Introduction"; George Nash "Feasting Fire, Illuminating Fire, Ritual Fire: A Case for its Use in the Late Neolithic Passage Grave Tradition in Wales"; George Dimitriadis, "A Brief Overview on 'Topographical Patterns' and Pyrotechnology Utensils in Rock Art Landscapes"; Henry C. Dosedla, "Space Concepts and the Significance of Fire in New Guinean Highlands Traditions"; Stanislas A. Grigoriev, "Experiments with Ancient Smelting Process on the Turgoyak Lake"; Fabio Cavulli and Dragos Gheorghiu, "Looking for A Methodology Burning Wattle and Daub Housing Structures. A Preliminary Report on An Archaeological Experiment"; and Dragos Gheorghiu, "The Building of A Chalcolithic Dwelling for A Pyroexperiment." Apologies to George and Dragos for not having gone back to the original Rumanian source. For further information, see www.editura.unibuc.ro or editura_unibuc@yahoo.com

Archaeometallurgy

Thomas R. Fenn, Associate Editor

The column in this issue includes the following categories of information on archaeometallurgy: 1) New Books; 2) New Articles; 3) Ph.D. Theses; 4) Previous Meetings; 5) Forthcoming Meetings.

New Books

Metallurgy and Civilisation: Eurasia and Beyond. Proceedings of the BUMA VI Conference Jianjun Mei and Thilo Rehren (eds.). Archtype Publications, London: 2009. 208pp., 150+ illus. Price £47.50 / US\$95.00 (paper). ISBN: 9781904982494. The papers presented here (proceedings of the BUMA VI conference in Beijing) provide a good overview of the breadth and depth of current archaeometallurgical research related to Asia and beyond. Many of the issues raised in this book, such as the beginnings of bronze metallurgy in China, the early history of lost-wax casting in Asia, the development of early steel-making technology in Europe and Asia, and the role of the steppe influence in metalworking in Eastern Zhou China, will continue to attract substantial research interest. The important role which casting technologies have played in large parts of Asia is immediately evident, as is the importance of studying technical aspects not in isolation, but as parts of complex and multi-dimensional cultural developments. It is evident that long-distance cultural connections and technological inspirations remained active over many millennia. The richness of past and present interactions, the ever-expanding archaeological knowledge (many of the papers abased on the most recent archaeological discoveries), and an

increasing cooperation across disciplinary, geographical and political boundaries visible in this volume are impressive.

The contents of the volume are divided into four sections. Papers in the first section, "Early Metallurgy across Eurasia", comprised "Ancient metallurgy in the Eurasian steppes and China: problems of interactions" (Evgenij Chernykh), "Early metallurgy in China: some challenging issues in current studies" (Jianjun Mei), "Metal trade in Bronze Age Central Eurasia" (Liangren Zhang), "Documentary and archaeological evidence for an antique copper-nickel alloy (baitong) production in southern China and its exportation to India" (François Widemann), "Metal trade between Europe and Asia in classical antiquity" (Alessandra Giunlia-Mair, Michel Jeandin and Ken'ichi Ota), and "The black bronzes of Asia" (Paul Craddock, Maickel van Bellegem, Philip Fletcher, Richard Blurton and Susan La Niece).

Papers in the second section, "Bronze Casting Technologies in Ancient China" included "Origins and evolution of the casting technology of Anyang bronze ritual vessels: an exploratory survey" (Yu Liu), "Three Western Zhou bronze foundry sites in the Zhouyuan area, Shaanxi province, China" (Wenli Zhou, Jianli Chen, Xingshan Lei, Tianjin Xu, Jianrong Chong and Zhankui Wang), "New research on lost-wax casting in ancient China" (Weirong Zhou, Yawei Dong, Quanwen Wan and Changsui Wang), "Incipient metallurgy in Yunnan: new data for old debates" (Tzehuey Chiou-Peng), "A study of the surface craft of weapons from the Ba-Shu region of ancient China" (Zihui Yao and Shuyun Sun), and "Production of signature artifacts for the nomad market in the state of Qin during the late Warring States period in China (4th–3rd century BCE)" (Katheryn M. Linduff).

Papers in the third section, "Ancient Iron and Steel Technologies in Asia" comprised "An early iron-using centre in the ancient Jin state region (8th–3rd century BC)" (Rubin Han and Hongmei Duan), "From western Asia to the Tianshan Mountains: on the early iron artefacts found in Xinjiang" (Wu Guo), "South Indian Iron Age iron and high carbon steel: with reference to Kadabakele and comparative insights from Mel-siruvalur" (Sharada Srinivasan, Carla M. Sinopoli, Kathleen D. Morrison, Rangaiah Gopal and Srinivasa Ranganathan), "Survival of traditional Indian ironworking" (Vibha Tripathi and Prabhakar Upadhyay), "Fine structures: mechanical properties and origin of iron of an ancient steel sword excavated from an old mound in Japan" (Masahiro Kitada), "Specialisation in iron- and steel-making in the early Middle East and Central Asia: myths, assumptions and a reassessment of early manuscript evidence" (Brian Gilmour).

And finally, papers in the last section, "Ancient Metallurgical and Manufacturing Processes" included "The early history of lost-wax casting" (Christopher J. Davey), "A natural draught furnace for bronze casting" (Bastian Asmus), "The liquation process utilised in silver production from copper ore: the transfer to and development in Japan" (Eiji Izawa), "A technical study of silver samples from Xi'an, Shaanxi province, China, dating from the Warring States period to the Tang dynasty" (Junchang Yang, Paul Jett, Lynn Brostoff and

Michelle Taube), and “Scientific analysis of lead-silver smelting slag from two sites in China” (Pengfei Xie and Thilo Rehren).

New Articles

From *Historical Metallurgy* 2007, 41(1):1-86, comes “Early Iron Age iron-smelting debris from Rwanda and Burundi, East Africa” (P. Craddock, Ian Freestone, Andrew Middleton, and Marie-Claude Van Grunderbeek), “Romano-British workshops for iron-smelting and smithing at Westhawk Farm, Kent” (Sarah Paynter), “Investigation of a broken pile-shoe from a Roman bridge” (R.J.H. Wanhill, P.A. Seinen, R.A. Rijkenberg, and H.J.M. Meijers), “A review of metallographic analyses of early medieval knives” (Eleanor Blakelock and Gerry McDonnell), “When aluminium was equal to gold: Can a ‘chemical’ aluminium be distinguished from an ‘electrolytic’ one?” (David Bourgarit and Jean Plateau), “Scientific examination of zinc-distillation remains from Warmley, Bristol” (David Dungworth and Harriet White), and from *Historical Metallurgy* 2007, 41(2):87-163, comes “Laurium and the hindered-settling model of ore-concentration” (Comment by Lynn Willies), “Laurium and the hindered-settling model of ore-concentration: a reply” (John Kepper), “Rotary tools and techniques for gold metallurgy during late prehistory in the Iberian Peninsula” (Alicia Perea and Barbara Armbruster), “English steelmaking in the seventeenth century: the excavation of two cementation furnaces at Coalbrookdale” (Paul Belford and Ronald A. Ross), “The north Worcestershire scythe industry” (Peter W. King), “Review article: *Myth, ritual and metallurgy*” (Roger Doonan). The first issue concludes with book reviews and the second with both book reviews and abstracts of recent works on ancient and historic metals and metallurgy.

In 2008, the Historical Metallurgy Society (HMS) produced two volumes of *Historical Metallurgy* (Vol. 42, Nos. 1:1-75 & 2:76-166), and a welcome return of its *Occasional Publication* series with the addition of a new volume. Contributions in the first issue of *Historical Metallurgy* Vol. 42 included “The beginning of copper mass production in the western Alps: the Saint-Véran mining area reconsidered” (David Bourgarit, Pierre Rostan, Emilien Burger, Laurent Carozza, Benoît Mille, and Gilberto Artioli), “The Austrian lift-hammer - its probable Walloon origin” (Brian G. Awty), “Rooiberg revisited - the analysis of tin and copper smelting debris” (Duncan Miller and Simon Hall), “Copper-based artefacts from Virginian sites: microstructures and compositions” (Aurélié Deraisme, Laure Dussubieux, Gérard Frot, Christopher Stevenson, Amy Creech, and Yves Bienvenu), and “Historical nail-making techniques revealed in metal structure” (Krysta Ryzewski and Robert Gordon), while the second issue of *HA* was dedicated to a collection of papers resulting from the colloquium *Steel in Britain in the Age of Enlightenment*, including an “Introduction” (Chris Evans), “Crucible steel as an enlightened material” (Chris Evans), “Steel at the dawn of capitalism: reformation, technology and enlightenment” (Paul Belford), “Steel in the Derwent valley: but enlightenment?” (David Cranstone), “The 18th-century Sheffield saw industry: its origins and relationship to crucible steel making” (Simon

Barley), “Steel and toy trade between England and France: the Huntsmans’ correspondence with the Blakeys (1765-1769)” (Liliane Pérez), and “‘Deceitful Wares’ - the quality control of knives by the Searchers of the Company of Cutlers in Hallamshire” (Joan Unwin). The first issue concludes with both book reviews and abstracts of recent works on ancient and historic metals and metallurgy and the second with book reviews.

Also in 2008 the HMS published *Occasional Publication* No. 6, *Metals and Metalworking: A research framework for archaeometallurgy*, compiled and edited by Justine Bayley, David Crossley and Matthew Ponting, 2008, Historical Metallurgy Society, London, ISBN-13: 978-0-9560225-0-9. Following an “Introduction”, the work is divided into three main parts and a brief “Part 4: Conclusions and agenda”. “Part 1: The resource” deals with the sources of historical metallurgical information and how to manage those resources while “Part 2: Methods in historical metallurgy” explores both field and laboratory methods for documenting, sampling and analyzing metallurgical sites and materials. “Part 3: Knowledge and understanding” presents a nice metallurgical history of the British Isles as background for synthesizing excellent examples of how archaeometallurgical information is used to understand the past. The focus of the work is heavily on England the British Isles, but this is to be expected considering the source and support from English Heritage. Overall, it is well illustrated and represents an excellent addition to archaeometallurgical literature.

Contributions to the *Journal of Archaeological Science* over the past year include a number of submissions relevant to archaeometallurgy. These are listed in order from most recent (dating to the 2009 November, no. 11, issue of *JAS*). Articles published in 2009 issues (Vol. 36) of *JAS* included “Non-ferrous metallurgy from the Phoenician site of La Fonteta (Alicante, Spain): a study of provenance” by M. Renzi, I. Montero-Ruiz, and M. Bode (pp. 2584-2596), “Pastoralist iron production on the Laikipia Plateau, Kenya: wider implications for archaeometallurgical studies” by L. Iles and M. Martín-Torres (pp. 2314-2326), “Special alloys from remote frontiers of the Shang Kingdom: scientific study of the Hanzhong bronzes from southwest Shaanxi, China” by K. Chen, T. Rehren, J. Mei, and C. Zhao (pp. 2108-2118), “Early copper smelting at Itziparátzico, Mexico” by B. Maldonado and T. Rehren (pp. 1998-2006), “Scientific examination of Shang-dynasty bronzes from Hanzhong, Shaanxi Province, China” by J. Mei, K. Chen, and W. Cao (pp. 1881-1891), “Slag inclusions in iron objects and the quest for provenance: an experiment and a case study” by E. Blakelock, M. Martín-Torres, H.A. Veldhuijzen, and T. Young (pp. 1745-1757), “Copper production at Baratti (Populonia, southern Tuscany) in the early Etruscan period (9th–8th centuries BC)” by L. Chiarantini, M. Benvenuti, P. Costagliola, M.E. Fedi, S. Guideri, and A. Romualdi (pp. 1626-1636), “Ancient copper and lead pollution records from a raised bog complex in Central Wales, UK” by T.M. Mighall, S. Timberlake, I.D.L. Foster, E. Krupp, and S. Singh (pp. 1504-1515), “The key role of zinc, tin and lead in copper-base objects from medieval Talgar in Kazakhstan” by J.-S. Park and D. Voyakin (pp. 622-628), “Identification of a

chrysocolla amulet in an Early Dynastic child mummy” by R. Bianucci, G. Mattutino, R. Lallo, and C. Torre (pp. 592-595), “The casting core composition and provenance of the Goljamata Kosmatka (Bulgaria) bronze head” by G. Lombardi (pp. 520-527), “Trace element fingerprinting of ancient Chinese gold with femtosecond laser ablation-inductively coupled mass spectrometry” by L.B. Brostoff, J.J. González, P. Jett, and R.E. Russo (pp. 461-466), “The history of the United States cent revealed through copper isotope fractionation” by R. Mathur, S. Titley, G. Hart, M. Wilson, M. Davignon, and C. Zlatos (pp. 430-433), “Variability in single smelting episodes – a pilot study using iron slag from Uganda” by J. Humphris, M. Martín-Torres, T. Rehren, and A. Reid (pp. 359-369), “The production of speiss (iron arsenide) during the Early Bronze Age in Iran” by C.P. Thornton, T. Rehren, and V.C. Pigott (pp. 308-316), and “Using mineral magnetism to characterise ironworking and to detect its evidence in peat bogs” by T.M. Mighall, I.D.L. Foster, P. Crew, A.S. Chapman, and A. Finn (pp. 130-139). Another archaeometallurgical contribution comes from the end of the previous issue in 2008 (Vol. 35), “An integrated approach to reconstructing primary activities from pit deposits: iron smelting and other activities at Tel Dor under Neo-Assyrian domination” by A. Elyahu-Behar, S. Shilstein, N. Raban-Gerstel, Y. Goren, A. Gilboa, I. Sharon, and S. Weiner (pp. 2895-2908).

Contributions to *Archaeometry* over the past year include a number of submissions relevant to archaeometallurgy. These are listed in order from most recent (dating to the 2009 October issue, No. 5). Articles published in 2009 issues (Vol. 51) included “Romano-Egyptian Red Lead Pigment: A Subsidiary Commodity of Spanish Silver Mining and Refinement” by M.S. Walton and K. Trentelman (pp. 845-860), “Detecting Forgeries Among Ancient Gold Objects Using the U, Th-⁴He Dating Method” by O. Eugster, J. Kramers, and U. Krähenbühl (pp. 672-681), “Detecting Changes of Celtic Gold Sources through the Application of Trace Element and Pb Isotope Laser Ablation Analysis of Celtic Gold Coins” by C. Bendall, D. Wigg-Wolf, Y. Lahaye, H.-M. Von Kaenel, and G.P. Brey (pp. 598-625), “Lead Isotope Analyses of Bronze Age Copper-Base Artefacts from Al-Midamman, Yemen: Towards the Identification of an Indigenous Metal Production and Exchange System in the Southern Red Sea Region” by L. Weeks, E. Keall, V. Pashley, J. Evans, and S. Stock (pp. 576-597), “The Origin and Geochemical Characterization of Red Ochres from the Tito Bustillo and Monte Castillo Caves (Northern Spain)” by E. Iriarte, A. Foyo, M.A. Sánchez, C. Tomillo, and J. Setién (pp. 231-251), “Post-Medieval Crucible Production and Distribution: A Study of Materials and Materialities” by M. Martín-Torres and T. Rehren (pp. 49-74). Another archaeometallurgical contribution comes from the end of the previous volume in 2008 (Vol. 50), “Unofficial Coinage in the Third Century AD in the Gallo-Roman World: Chemical and Physical Analyses for Determining the Localization of the Workshop” by A. Deraisme and J.-N. Barrandon (pp. 835-854).

Ph.D. Theses

Changing technologies and transformations of value in the Middle Volga and northeastern Caucasus, circa 3000--1500

BCE. David Larn Peterson (The University of Chicago, Illinois, 2007, 585 p.). Abstract (Summary): In this dissertation I investigate the role of metal making as a technical and value system over the course of the Bronze Age in the Middle Volga region of the western Eurasian steppes, and the Early to Middle Bronze Age (early to middle 3rd millennium BC) at Velikent, Dagestan. The chief geographic focus is Samara, Russia, from where I examined nearly 100 metal objects from previously excavated kurgan cemeteries, in order to identify similarities, differences, and changes in the activities through which people created and transformed value in metalwork. I also explore how metalwork was used to objectify social distinctions and social values through adornment, and in mortuary rites and alliances.

A survey of traces of mines in northeastern Samara provided a rare opportunity to characterize the scale and organization of the small, dispersed metal production that characteristic of the area in the Late Bronze Age.

EPMA-WDS was utilized for compositional analysis. The results show the importance of recycling in Middle Volga metalworking, especially in the Middle Bronze Age II period. Variations in the metal pool for different cemeteries of the period are supported by statistically verified differences in work patterns as identified by metallography. Metal making itself may have been an important source of communal authority, which positioned participants for direct engagement with outside groups and the formation of new networks. Examined in light of the appearance of specialized communities of metal producers in the neighboring South Urals at this time, the argument is made that the new commodity role of copper and bronze may have been a source of tensions, encouraging metalworkers in Samara to form new networks for the acquisition of bronze (which could not be replenished through local metalworking practices alone) with Volga-Kama forest dwellers to the north.

Tin bronze entered a long-standing tradition of arsenic bronze production at Velikent, where it took on added importance in bodily adornment, along with the systematic production and uses of copper and alloys in the northeastern Caucasus. Methodologically, the dissertation shows that *archaeometallurgy* is an important research area for anthropological archaeology.

The Chalcolithic and early Bronze Age Metallurgy of Tepe Hissar, northeast Iran: A challenge to the ‘Levantine Paradigm’. Christopher Peter Thornton (University of Pennsylvania, 2009, 501 pp.). Abstract (Summary): In this dissertation, the scientific analyses of the metallurgical remains from Tepe Hissar, a 4th and 3rd millennium site in Northeastern Iran, are presented and juxtaposed with a new understanding of the 2000-year archaeological sequence at the site. It is argued that two types of contemporaneous metallurgical production occurred within this ‘middle range’ community: traditional practices (so-called “cottage industry”) and standardized practices (e.g., workshop production). While traditional models for the development of metallurgy in Southwest Asia (the “Levantine Paradigm”) would see these two types of production as representing entirely different stages in social development, at Tepe Hissar they are carried out at the same

time and less than 100m from each other. Furthermore, the sophistication of metallurgical production at this site, particularly among the more 'traditional' practitioners, is truly staggering, and forces us to reconsider what independent craftspeople in small-scale societies understood about the chemical and material properties of the objects they made and used.

In addition to challenging the "Levantine Paradigm," this dissertation set out to test theoretical discussions of "craft specialization" by applying various models to the data compiled herein. Although difficult in this situation to speak confidently about the craftspeople themselves, given the lack of suitable burial information and the secondary contexts of most of the metallurgical remains, it seems evident that using the concept of specialized craftspeople (e.g., "independent" vs. "attached" specialists) to compare the traditional vs. standardized practices at Tepe Hissar is not suitable. Instead it is argued that the spatial context of production directed technological practice, and not the level of specialization held by the artisans themselves. That is, distinct areas of the site (called "workshops") were designated for specialized (and standardized) production, while other areas (called "houses") were used for non-specialized, traditional craft production--a distinction not necessarily requiring different craftspeople. While this critique of "craft specialization" must await further analysis of the crafts from this site and others, the metallurgical remains from Tepe Hissar present an interesting case study for craft production in ancient societies that should resonate with our understanding of craft production in traditional societies today.

Previous Meetings and Conferences

The 2nd Latin-American Symposium on Physical and Chemical Methods in Archaeology, Art and Cultural Heritage Conservation (LASMAC 2009) was carried out with the *Archaeological and Arts Issues in Materials Science Symposium* as part of the *International Material Research Congress 2009* in Cancun, Quintana Roo, Mexico from 16-20 August 2009. A number of papers of a variety of topics were presented within these symposia, including a handful on topics relating to metals and minerals. Presented papers included "Fingerprinting Lapis-Lazuli from Chile and Afghanistan Using an Integrated Analytical Approach" (Thomas Calligaro), "Microstructural Study of Gilded Copper Artifacts from the Chichén-Itza Cenote" (Jesús Arenas Alatorre), "Micro-Sr-XRF Studies for Archaeological Gold Identification – The Case of Carpathian Gold and of Dacian Bracelets" (Bogdan Constantinescu), "Infrared Reflection Spectrometry Analysis as a Non-Destructive Method of Characterizing of Minerals and Stone Materials in Archaeometric and Geoarchaeological Application" (Mikhail Ostrooumov), "Metallographic Evidences of Bronze Casting Working Conditions at Moscow-Volga Region During Early Iron Age" (Irina Saprykina). A selection of posters also covered "Comparison between Pre-Columbian Alloys from the Royal Tombs of Sipán and from the Museum of Sicán Analyzed with a Portable Equipment Using EDXRF" (Angel Guillermo Bustamante Dominguez), "Implementation of Techniques for the Study of Vitreous and

Metallic Materials from the Archaeological Site "Guardia Del Monte", San Miguel Del Monte, Buenos Aires Province" (Maria Ines Casadas), "The Manufacturing Techniques of the Turquoise Mosaics from the Great Temple of Tenochtitlan, México" (Emiliano Ricardo Melgar Tísoc), "EDXRF Measurements of Brazilian Old Coins" (Marcia de Almeida Rizzutto), and "Warrior's Belt from the Middle Volga Burial Ground X A.D. - Technology and Extraction" (Irina Saprykina). The proceedings of the symposia are typically published within the *MRS Archaeological and Arts Issues in Materials Science Symposium* series, so look for that to come out in about a year. A copy of the program can be found at: <http://www.mrs-mexico.org.mx/webimrc09/documentos/s3-program.pdf>.

The *Seventh International Conference on The Beginnings of the Use of Metals and Alloys, BUMA-VII*, was held from 13-18 September 2009 at the National Institute of Advanced Studies, Bangalore, India. Papers and posters were presented within session along the following themes: Metallurgy and Interaction across Eurasia, Ancient Iron and Steel Technology, History and Production of Copper-based Alloys, Precious Metals, Metallurgical Processes, Metalware Production, and Metal Workshops. Paper titles and authors included "Could Kumaun, Uttarakhand also be the source of the Harappan Copper?" (D.P. Agrawal), "Mineral resources and alloys on 2000 BC Pyrgos/Mavroraki metallurgical site" (Maria Rosaria Belgiorno), "The Bronze Age to Iron Age transition in Southeast Asia" (Anna Bennett and Ian Glover), "New avenues for studying the Iron Age copper industry in the southern Levant" (Erez Ben-Yosef, Thomas E. Levy and Mohammad Najjar), "Geomagnetic archaeointensity as a tool for dating slag deposits: examples from the southern Levant" (Erez Ben-Yosef, Lisa Tauxe, Thomas E. Levy, Hagai Ron and Amotz Agnon), "Early use of iron in Aksum. Trade and technology transfer networks across the Ethiopian highland" (Constantin Canavas), "The reconstruction of a 7th c. AD blacksmith workshop in Central Italy" (Marco Cavalieri, Alessandra Giumlia-Mair, and Alan J.A. Mair), "The iron objects and iron smelting technologies of South China during the Han Dynasty" (Jianli Chen), "New Research on Regional Bronze Industries during the Shang Dynasty: the Hanzhong Case" (Kunlong Chen, Congcang Zhao, Jianjun Mei and Thilo Rehren), and "Metals and alloys in the past: archaeometallurgical perspectives on interaction between southern Africa and the Indian Ocean rim" (Shadreck Chirikure).

Other papers covered "Surface and Bulk Investigations on Bronze Roman Nummi" (Enrico Ciliberto, Maria Luisa Carrara, Salvatore Garraffo and Angelo Nicolosi), "Phosphate Corrosion Crust in XVIII sec. Bronze Medals" (Enrico Ciliberto and Francesca DiStefano), "Scientific Analysis of Some Bronze Artifacts unearthed from Fenshuiling Cemetery, Shanxi Province" (Jianfeng Cui and Binghua Han), "Egyptian Old Kingdom metal workshop practice" (Christopher J. Davey), "Technical Investigations of Iron objects found during excavations at Vidharbha Region of Maharashtra, India" (P.P. Deshpande), "The application of Rietveld refining methods and AFM on hydrothermal reactivity of polymetallic Ore Sources based on Archaeometallurgical finds in Meymand Cave

Dwelling Village, Kerman, Central Iran” (S. Mohammadamin Emami), “Multiphase microstructures on late imperial Chinese brass coins” (M.J. Furtado), “New Observations on the Pactolus Alluvial Gold Grains of Sardis, Turkey” (A.E. Geçkinli), “The making and heat-treating of crucible steel: early manuscript evidence” (Brian Gilmour), “Hunnish gold in the Csongrád County, Hungary” (A. Giumlia-Mair and B. Kürti), “Ceramic Shell Casting of Copper-Based Artifacts During the Early 4th Millennium BC in Israel, New Discoveries” (Yuval Goren, Dana Ashkenazi and Shai Glibter), “Origin of iron metallurgy in Northern Eurasia” (S. Grigoriev), “Metallographic Study of 28 Metallic Artifacts Unearthed from Two Sarcophagus Tombs at Beipiao, Liaoning Province” (Rubin Han), “Chalcolithic copper artefacts from the northern Indian Subcontinent: New lead isotope data and possible relations to Mesopotamia” (A. Hauptmann, S. Klein and P. Yule), “The Composition of Indus Copper Alloys: Initial Results of XRF Analysis from Harappa” (Brett C Hoffman), “A New Discovery: Manganese as Flux Agent from the Song Dynasty Iron-Smelting Sites in the Xingye County, Guangxi, China” (Quansheng Huang and Yanxiang Li), “The relation between Mediterranean area and north west China before 221 BC – evidence from the technical and archaeological study of tinned objects excavated from Ma jia yuan site, Gansu province” (Wei Huang, Xiaohong Wu, Jianli Chen and Wang Hui), “Matte prills in slag from smelting of oxidized copper ore in ancient Japan” (Eiji Izawa), “Caste, Community and Rituals in Wootz Making Centres of Telangana -A Cultural Continuity in Wootz making Tradition” (S. Jaikishan), “Metal Antiquities and their Conservation” (V. Jeyaraj), “Iron Extraction Technology in Ancient India (With reference to their therapeutic Importance)” (C.B. Jha, Sudhaldev Mahapatra, Ramesh Gupta, and Dr. Rekha Chaturvedi), “Study on Ancient Bronze alloys from Nanling county” (Ying Jia, Pingsheng Liu and Yunlan Huang), “Late Bronze Age and Early Iron Age Gold Mining in the Eastern Rhodopes (Bulgaria)” (Albrecht Jockenhövel and Hristo Popov), “Bronze age and writing system of Sarasvati hieroglyphs evidenced by two ‘rosetta stones’ Decoding Indus script” (S. Kalyanaraman), “Protective Scale Development and Evaluation over Delhi Iron Pillar” (U. Kamachi Mudali and Baldev Raj), “Manufacturing and Characterization of South Indian Bronzes” (U. Kamachi Mudali and Baldev Raj), “Archaeometallurgical survey in Sikar District, Rajasthan” (J. S. Kharakwal), “Bidri ware: investigation of the nature of the black patina” (Susan la Niece, Nigel Meeks and Chris Jones), and “Behavior Chains and the Chaîne Opératoire for Ethnoarchaeology in India – A Case Study from the Hereditary Bronze Casters of Swamimalai” (Thomas E. Levy).

Other papers included “The regional characteristics of and interactions between the early bronze metallurgies of the Northwest and Central Plain” (Shuicheng Li), “Standardisation and Labour Organisation in the Qin bronze weapons for the Terracotta Warriors, China” (Xiuzhen Janice Li, Marcos Martinon-Torres, Andrew Bevan, Thilo Rehren), “An analysis of the technology of metallic artifacts unearthed from Jiandchuan Haimenkou site of Yunnan in 2008” (Xiaocen Li, Yali Yun and Rubin Han), “What’s Mine is Yours: The Transmission of Metallurgical Technology in Eastern Eurasia and East Asia” (Katheryn M. Linduff), “Casting Technology

and Production of Bronzes in Late Shang Dynasty: A Multiple Craft Perspective (Yu Liu and ZhanweiYue), “Studies of Early Bronze Metallurgy in the Yili Region, Xinjiang, China” (Jianjun MEI, Yong LING, Enguo LU), “Lock-in Thermography – An innovative and possible technique for non invasive classification of ancient coins” (M. Menaka, B. Venkatraman and Baldev Raj), “The application of Rietveld refining methods and AFM on hydrothermal reactivity of polymetallic Ore Sources based on Archaeometallurgical finds in Meymand Cave Dwelling Village, Kerman, Central Iran” (S. Mohammadamin Emami), “Forging technique for Korean high tin bronzeware “ban-bangjja” and its microstructure” (Takekazu Nagae, Han, Min-Su, Lee Eun Seok, Lee Sang-Yong, Haruhisa Mifune, Yasuji Shimizu and Shinya Shoda), “Mass and Heat Balance of Pig Iron Making by Tatara” (Kazuhiro Nagata), “Variations of the chemical composition of Japanese early modern silver coin “ Ichibu-gin” (Tetsuya Nakanishi), “Banahalli- An Iron Age Wootz Steel Production centre” (B.Narasimhaiah, B.Raghunatha Rao, B.Sasisekaran, S.Sriram), “The microstructure - property relationship of the ancient bronzes in China” (Chunxu Pan, Lingmin Liao and Yali Hu), “Arcaeological Evidence of Metallurgical Activities in Rajasthan” (Lalit Pandey), “Copper and Its Alloys in Ancient India” (Nidhi Pandey), “Archaeo-metallurgical Studies of Iron Artifacts from Gujarat, Western India” (Ambika Patel), “South India’s Traditional Knowledge in Shaping High Tin Bronze” (R.M. Pillai, S.G.K. Pillai and A.D. Damodaran), and “Religious Traditions of Ferrous Paleometallurgists of Japan” (B. Prakash).

Lastly, papers also covered “Cultural Transmissions in Archaeometallurgical Landscapes: The Case from Southeast Asia” (T. O. Pryce), “Khao Sam Kaeo - an Archaeometallurgical Crossroads for Trans-Asiatic Technological Traditions” (T.O Pryce, M. Murillo-Barosso, M. Martínón-Torres and B. Bellina), “Microstructural Evolution during Forge Welding of Delhi Iron Pillar”(Baldev Raj, T.Jayakumar, Anish Kumar, K.V.Rajkumar, A.Joseph, B.Venkatraman and C.Babu Rao), “Adichanallur: A Prehistoric Mining Site” (B.Sasisekaran, S.Badrinarayanan, D.Venkata Rao), “Chemical, Metallographical and Petrographic Study of Chalcolithic Copper Finds from Pequin Cave” (Irina Segal and Yuval Goren), “A technological study of a complex of bronzes from the protohistorical pile-dwelling site of Celano Paludi in Abruzzo, Italy” (Anna Maria Bietti Sestieri, Giorgio Cerichelli, Vincenzo D’ercole, Claudio Giardino, Maria Laura Mascelloni), “The Forging of Israel: Archaeometallurgical evidence of Early Iron Age metal production in the Land of the Bible” (Sariel Shalev), “The Character of Bronze Adoption Process in Northeast Asia” (SHODA Shin’ya), “Comparative Study of Bronze Adoption Processes in Northeast Asia and Northwest Europe: Daggers in stone and bronze” (SHODA Shin’ya and Catherine Frieman), “The Re-comparison of Zinc Smelting Techniques Used in Ancient India and China” (Liu Siran and Jianli Chen), “Archaeometallurgical and ethnoarchaeological insights on bronze casting traditions in Tanjavur district, southern India” (Sharada Srinivasan), “Unleaded and high-tin bronzes: further insights from Indian and Southeast Asian finds” (Sharada Srinivasan, Ian Glover and S. Ranganathan), “Casting in Transition: from piece-mold to

lost-wax in early Chinese Buddha sculptures” (Donna Strahan), “A preliminary study of solders and soldering methods of ancient Chinese bronzes (9th - 3rd centuries B.C.)” (Shuyun Sun and Jianjun Mei), “Metallurgical Innovations and Pattern of Adaptation of Iron in the Cultures of Ganga Plains in the 1st Millennium BCE” (Vibha Tripathi), “Procurement and use of tin in ancient India” (Prabhakar Upadhyay), “Improvements in Indian Ancient Iron Making Technology at the National Metallurgical Laboratory, Jamshedpur, India” (A. K. Vaish, S. D. Singh and M. M. Humane), “Khmer bronze craft and craftsmen during the Angkor period (12th-13th centuries): archaeometallurgical study of bronze artefacts from the Phnom Penh National Museum” (Brice Vincent), “A study on Bronze Drums of the Kmuic in Laos to Those of the Same Type in Its Neighbouring Nations” (Danfang Wei and Fubin Wan), “Damascene steel and Bin-tie: a relative steel technology between South Asia and China” (Wei Qian), “Indian steel in Medieval European swords” (Alan Williams), “Scientific Examination of Diverse Metal Objects of the Bronze Age from the Hejiashan Site, Western Yunnan” (Yali Yun), and “The origin of lost-wax techniques & the characteristics of lost-wax castings” (Weirong Zhou). More information and downloads of the program and abstracts can be found at the following website:

<http://materials.iisc.ernet.in/buma2009/>.

“*Eastern Mediterranean Metallurgy and Metalwork in the Second Millennium BC*” an International Conference in honour of James D. Muhly, was held at the University of Cyprus, Nicosia, on 10-11 October 2009. The conference began early Saturday morning, 10 October, with opening welcomes by University of Cyprus officials Demetrios Michaelides (Director Archaeological Research Unit) and Constantinos Christophides (Vice Rector of Academic Affairs), which were followed by Vassos Karageorghis, Director of the A. G. Leventis Foundation and legend of Cypriot archaeology, and Robert Maddin, Professor Emeritus, University of Pennsylvania, “Reminiscing” of Working with Jim Muhly. Paper presentations followed and comprised “Late Bronze Age copper production in Cyprus from a geologist’s perspective” (George Constantinou), “Metallurgical production and exchange on Bronze Age Cyprus” (A. Bernard Knapp), “Pyrgos/Mavrorachi in Cyprus metallurgy” (Maria Rosaria Belgiorno and Daniela Ferro), “Tinker, tailor, farmer, miner: metals in the Late Bronze Age economy at Kalavassos” (Alison South), “Standing on ceremony? Copper metallurgy at Maroni-Vournes” (Gerald Cadogan, Roger Doonan, and David Sewell), “Broken Symbols: Aspects of metallurgy at Alassa” (Sophocles Hadjisavvas), “From regional gateway to Cypriot kingdom: Copper deposits and copper routes in the chora of Paphos” (Maria Iacovou), “The role of the Apliki mine region in the post 1500 BC copper production and trade networks in Cyprus and in the wider Mediterranean” (Nöel H. Gale and Zofia A. Stos-Gale), “Reconstructing” the Enkomi tombs (British Excavations): An instructive exercise” (Despo Pilides), “Metallurgy and metalwork in Enkomi: the early phases” (Vasiliki Kassianidou), “Niello versus Kuwanna, the examination of the Enkomi cup” (Alessandra Giunlia-Mair), “Profusion of Cypriot copper abroad and dearth of bronzes at home: reflections on a paradox in Late Bronze Age Cyprus”

(Georgios Papisavvas), “Cypriot copper and the transformation of Minoan metals production in the Late Bronze Age” (Philip P. Betancourt), “Bronzesmithing in the harbour-town of Knossos at Poros-Katsambas” (Nota Demopoulou Rethemiotaki). The remaining papers given Sunday included “The oxhide ingots in Central Mediterranean” (Fulvia Lo Schiavo), “On the ceasing of the local copper production in the Aegean 2nd millennium BC” (Ioannis Bassiakos and Thomas Tselios), “Cyprus beyond the East Mediterranean in the second millennium: developments and perspectives” (Anthony Harding), “Late Bronze Age Alalakh and Cyprus: A relationship of metals?” (Aslihan K. Yener), “The evidence for metallurgical workshops of the 2nd millennium in Ugarit and the Levant” (Ella Dardaillon), “The merchants of Ugarit: Oligarchs of the LBA trade in metals?” (Carol Bell), “QANTIR-PIRAMESSE --- Bronze workshops of industrial dimensions” (Edgar Pusch), “The metallurgy of bronze production at Qantir – Pi-Ramesse” (Thilo Rehren and Edgar Pusch), “The emergence of tin-bronze metallurgy across the Asian Old World – a question of sources and societal impact” (Vincent C. Pigott), and “Just a few rusty bits: the innovation of iron in the Eastern Mediterranean in the 2nd and 1st millennia BC” (Xander Veldhuijzen). The conference link provides access, via an interactive PDF, to the conference Program and Abstracts, as well as particulars for participants. http://www.ucy.ac.cy/data/archreun/Conferences/EasternMediterraneanMetallurgy/Eastern_Mediterranean%20Metallurgy_and_Metalwork.pdf

Forthcoming Meetings and Conferences

A workshop course will be offered by Alessandro Pacini on Ancient Etruscan Gold-working Techniques. This course will be offered from 2-5 November 2009 in Montepulciano, Italy. More details can be found at: www.aliseda.it/alessandro/corsidisco.htm.

ArchaeoMetallurgy Conference: In Celebration of Gerry McDonnell at Bradford University will be held at the University of Bradford, 10-12 November 2009. Dr Gerry McDonnell is leaving the University of Bradford’s Division of Archaeological Science. The overall aim of this conference is to therefore celebrate the research carried out by Gerry McDonnell during his time at Bradford, and to wish him well for his future research. The conference has been combined with the Historical Metallurgy Society’s 2009 Research in Progress Meeting, and offers a varied program covering slag, ferrous and non-ferrous metals, spanning multiple time periods and research from across the world. For more information and to see the provisional program, visit the website www.archaeomaterials.me.uk/conf/archmet09.html or email eleanor.blakelock@ironsmelting.net.

Papers listed in the provisional program from the first day of the conference include “One Man’s Waste is Another Man’s Obsession- A Theoretical View of the Role of Slag within Archaeometallurgical Research” (Allan Daoust), “Colour Change in Copper Alloys through Alloying” (Lien Fang), “Iron Age Grey Slags” (Jane Cowgill), “Nidderdale Iron Project” (Jim Brophy), “A study of wear in Roman and Early Medieval

knives" (Ed Kendal), "Early Medieval iron technology, changes with the coming of urban settlements" (Eleanor Blakelock), "Aspects of the introduction of water power to iron smelting, 13th-15th centuries, Shropshire, England" (Tim Young), "The Asante Ewer and the casting technology of large Medieval Bronze Jugs" (Susan La Niece), "Tudor arrowheads: battlefield finds under the microscope" (Rachel Cubitt & David Starley), "The impact of the medieval and early modern iron industry on the woodlands of Rievaulx and Bilsdale, North Yorkshire, UK" (Jane Wheeler), "Kiln hunting! In search of the definitive earthwork evidence for chop-wood/white coal production" (Janis Heward), and "The other side of the melt; Bradford's fire-brick industry" (Derek Barker).

The second day of the conference includes "Metals, evaluation and materiality" (Tim Taylor), "Accessing skills of the first European metalworkers: metallographic analysis of copper implements from Plocnik, a Vinca culture site in south Serbia" (Miljana Radivojevic), "Identification of raised vessel manufacturing workshops in Late Minoan Crete" (Christina Clarke-Nilsen), "From Bronze to Copper: The Effect of Recycling on Copper Alloys in prehistory" (Giovanna Fregni), "Found the furnace!" (Xander Veldhuijzen), "Geophysical prospecting on iron slags in Hamadab/ Northern Sudan" (Burkart Ullrich), "Forging, Texts, and Identity: Understanding iron and iron workers in EIA Greece" (Roger Doonan), "Iron and the Parisi" (Peter Halkon), "Iron Cart Tyres from Wetwang: a brief metallographic examination" (Janet Lang), "Smithies and ironworking in Denmark" (Arne Jouttijärvi), "Roman age ironmaking in Mid-Norway" (Arne Espelund), and "Ironworking in Roman Worcestershire and surrounding areas: can we compare data across commercially excavated sites?" (Christine Elgy).

The final day of the conference included papers on "Silver for the Emperor" (Bastian Asmus), "How to part silver from copper. Understanding *Saigerprozess* through experimental liquation and drying" (Maxime L'Héritier), "Silver refining in Medieval times" (Marie-Pierre Guirado), "Slag? What slag? In search of evidence for medieval lead/silver smelting" (Peter Cloughton), "Understanding Lithage Cakes" (Justine Bayley), "Interim results of the Stanley Grange Medieval Iron Project" (Patrice de Rijk), "Experimental ironmaking processes of the 1720s" (Peter King), "Steel blades made in Sheffield 1624-1924" (Joan Unwin), "Archaeometallurgy of copper coins rescued from a historical site in Rio de Janeiro" (Guillermo Solorzano), and "Chemical evidence for the origin of hammerscale" (Tim Young).

The *Early Scottish Metallurgy: HMS Archaeology Day Meeting*, Spring 2010, will be held in Edinburgh, Scotland, on Saturday, 20 March 2010. The meeting will be on the subject of early Scottish metallurgy (up to c. AD1000). Offers of papers (along with an abstract) should be sent to Fraser Hunter, National Museum of Scotland, Chamber Street, Edinburgh, EH1 1JK, UK. Email: fjh@nms.ac.uk.

The *International Conference on Historic Metals Conservation*, Interim Meeting of the ICOM-CC Metal WG, will be meeting from 11-15 October 2010, in Charleston, South

Carolina, USA. Original papers are invited for submission under the following themes: 1) Case Studies and Treatments, and 2) Research and Treatment Development. The first theme includes papers within the topic of Technical and Authentication Studies; Conservation of Large Artifacts; Conservation of Composite Artifacts; Mass Treatment; and, Conserving Artifacts on a Budget. The second theme includes papers within the topics of Advances in Metal Analysis and Corrosion Characterization; Progress in Conservation Treatments; New Approaches in Metals Protection; Monitoring Artifacts Before and After Conservation; and, Technology Transfer from the Industry. The deadline for abstracts submissions has passed, but details of the call for papers can be found at: <http://www.icom-cc.org/54/document/call-for-papers-historic-metals-conservation/?id=485>.

Bioarchaeology

Gordon F.M. Rakita, Associate Editor

The following are sessions and symposia organized for upcoming 75th anniversary Society for American Archaeology meetings (St. Louis, MO, USA, 14-18 April 2010; see <http://www.saa.org/AbouttheSociety/AnnualMeeting/tabid/138/Default.aspx>) that may be of interest to Bioarchaeologists:

Thursday, April 15th

- Sponsored Symposium: NAGPRA in 20/20 Vision: Reviewing 20 Years of Repatriation and Looking Ahead to the Next 20 (Sponsored by Committee on Native American Relations)
- Symposium: Beyond Biological Need to Eat: Archaeologies of Food and Foodways
- Forum: Establishing Professional Standards for Forensic Archaeology
- Poster Session: Paleodietary Analyses
- Poster Session: Evidencing Ancient Carbohydrate Revolutions in South-Central North America

Friday, April 16th

- Symposium: Seed of Change: Early Holocene Subsistence Diversification and Technological Change Across the Desert West
- Poster Session: The UWM Milwaukee County Institution Grounds Cemetery Research Initiative: Progress and Prospects
- Poster Session: An Integrative Vision: Papers in Celebration of the Life and Work of Phillip L. Walker (1947-2009)
- Symposium: Are We What We Eat? Continuity and Change in Food During Culture Contact in North America
- Symposium: The Performance of Mortuary Ritual in the American Southwest
- Symposium: Forensic Archaeology: Recent Cases, Current Research
- Roundtables:

- NAGPRA and the SAA: Conflict, Accommodation, and the New face of North American Archaeology with Michael Wilcox
- Life on the Edge: Interdisciplinary Archaeology with Jane Buikstra

Saturday, April 17th

- Symposium: Current Research on Isotopic Analyses in Archaeology and Zooarchaeology
- General Session: Subsistence, Ritual, and Social Organization in the Desert Southwest
- General Session: Mortuary Archaeology in the Americas

Sunday, April 18th

- Symposium: Paleodemography: Advances and New Trends in Agricultural Populations in Mesoamerica

Also, do not forget that the American Association of Physical Anthropologists' 79th Annual Meeting will be held in Albuquerque, New Mexico (14-17 April). See: <http://www.physanth.org/annual-meeting/2010> for more information.

Book Reviews

Deborah L. Huntley, Associate Editor

The Archaeology of Black Markets: Local Ceramics and Economies in Eighteenth-Century Jamaica. Mark W. Hauser. University Press of Florida, Gainesville: 2008. xxiii + 269 pp., 65 figures, 16 tables, 2 appendices, index. Price US\$65 (cloth). ISBN: 978-0-8130-3261-0.

Reviewed by Jun Sunseri, University of California, Berkeley, 232 Kroeber Hall, MC#3710, Berkeley, CA 94720, USA

The latest in the Ripley P. Bullen Series from the Florida Museum of Natural History, *The Archaeology of Black Markets*, re-examines the links between the African Diaspora and Caribbean studies via the material record of potters who crafted new economic and social spaces within plantation Jamaica. The successes of European colonies in the Caribbean are well known to have rested squarely on the shoulders of people forcibly transported there to toil in industrial agriculture. However, Hauser argues that some independent control of the products of enslaved women's labor allowed them to engage with the power structures of those who purported to control them. The agency of these potters to affect plantation life occurred in places and in ways beyond planters' invigilation and reach. By combining ethnohistoric, documentary, and archaeological data regarding the production and distribution of utilitarian pottery, *Black Markets* provides a compelling approach to understanding the important roles of subaltern household production within plantation society. In the process, Hauser unpacks some of the tensions that resulted from the creation and maintenance of social networks embedded in a necessary, yet illicit aspect of the colonial Caribbean economy.

Based upon the author's dissertation research in Jamaica, the book is organized in a way that lays out both the historiography of the region and research antecedents while working towards a methodological concentration on a particular subset of earthenware vessels. In his introduction, Hauser sets the hook with the explosive rebellion of 1831 and lays out the premise of the rest of the book in terms that relate the irony of an exploitive plantation system whose success was reliant on the development of personal wealth among the enslaved. In the street markets for which the book is named, subaltern communities accumulated wealth and information which contributed to their struggles for self-determination. In the process, the social networks they built may have allowed for connections between communities of enslaved which were unanticipated by plantation elites and, as Hauser relates, by later historians and archaeologists.

Chapter 1, Historical Archaeology of the Caribbean Plantation. This theoretical and historical literature review contextualizes the localized analysis of Jamaican ceramics within the global processes of Caribbean plantation economics. Touching base with Giddens and Bourdieu, Hauser connects the forces of commoditization enacted on people from Africa with the more intimate practices and choices leading to a material record of the silenced. Out of the spatialized logics (p.27) of colonial cartography and estate planning, processes of racialization and transculturation were institutionalized. These are topics referenced elsewhere in the book, but not developed for reasons including those mentioned below. Nonetheless, though foodways (and implicitly the ceramics involved in maintaining, changing, and inventing them) are mentioned as one of the most apparent transformative practices (p. 32), the multiscalar approach advocated here and in later chapters is directed towards an opposite end of the spectrum. At the larger regional scale, island-wide ties between localities of production and distribution are argued to be more appropriate research foci.

Chapter 2, Markets of Contention: Historical and Legal Perspectives on Informal Economies in Eighteenth-Century Jamaica. This review of literature on the internal markets of the African Diaspora shows us how historical documentation richly positions 18th century Jamaican informal trade loci within plantation life. At the same time, Hauser reveals the silences regarding the scale and scope of production and networking which enslaved people created. Though many authors have illustrated the dual economy, accelerated by the independent production of subaltern plantation communities, the documents related in this chapter really bring voice to the needs and anxieties of middle-class white planters, who were reliant on black agency. Locating the market as the site of ethnogenesis, Hauser argues that the compounding factor of colonial elites' lack of information about and control of these places that made them such fertile ground for community formation.

Chapter 3, Between Urban and Rural. By pointing to other historical archaeologies of subaltern consumption patterns (e.g. Wilkie 1999, 2000, 2003) Hauser advocates his approach to distribution of Jamaican-produced earthenware pots. Known as yabbas, these pots are proposed to be an aspect of the material

record specifically well-suited to revealing how connected and/or mobile black potters and merchants were across plantation Jamaica. His choice of sites, and their concomitant urban or rural aspects, is convincingly argued to best relate scales of local ceramic production and distribution. The spatialized research question, therefore, interrogates the nature of social networks revealed by local markets versus regional systems of exchange.

Chapter 4, *Routing Pots: Ceramics of the African Diaspora*. Here, the meat of the book's argument is laid out in relation to previous colonial earthenware research. Rather than trying to locate markers of ethnic identity among diverse technical or stylistic attributes, Hauser argues that evidence for the production, use, and sale of yabbas links the market system to the social networks of the enslaved. I appreciate that he tackles the complications of using the concept of "colonoware" as a generalized category of African-derived ceramics. By acknowledging the complex histories and diverse cultural admixtures of the people who would contribute to colonial ceramic production (including indigenous Caribbean people), the fixture of identity with a given type or source of pottery is left for others to wrestle with. Instead, Hauser focuses on the variability of the yabbas themselves as key to understanding the scale of commodity flow through Jamaican street markets (p. 119).

Chapter 5, *Rooting Pots: Jamaican Colonial Ceramics*. Beautiful ethnohistoric, photographic, and historic depictions of two centuries of Jamaican ceramic/yabba forms and contexts introduce the continuities and changes in yabba form and manufacture. By focusing on a limited subset of yabbas, the reduction in variation of rim diameters and decoration during the eighteenth century among Jamaican sites seems apparent enough to suggest increasing importance of yabbas as trade items. Within this hypothesis, a priori assumptions about the "crudeness" or "simplicity" of forms as necessary relegations to limited geographic distribution are a cautionary tale to historic archaeologists everywhere. If Hauser has nailed down evidence for a larger scale of production than domestic manufacture, then the organization of labor around these coarse earthenwares may really have changed the nature of economic power wielded by local potters.

Chapter 6, *Locating Enslaved Craft Production: Petrographic and Chemical Analysis of Eighteenth-Century Jamaican Pottery*. In exploring the scale and intensity of production and distribution via sourcing, the author is refreshingly upfront with the limitations of NAA and petrography in the absence of potential raw clay sources. Nevertheless, his discovery of similar clay recipes among northern, central, and southern Jamaican sites strongly suggests a very large scale of yabba production. I agree that the significance of these findings revolves around their ability to texture the lived economic experiences of enslaved laborers and highlight the potential for construction of social networks to contest or limit control of colonial regimes, as argued in the epilogue.

Overall, *An Archaeology of Black Markets* does a great job of illustrating how the rubber hits the road on questions of

production and networking in historical archaeology. Researchers interested in the scale of dual economies, including graduate students and advanced undergraduates, will appreciate how thoroughly the explanation of historical perspectives on colonial economies and power relations is brought into dialogue with material evidence for engagements unseen and probably as defining of colonial Jamaica. A more in-depth look at the multi-scalar arguments regarding community consolidation might have included links between smaller-scale discussions of intrasite differentiation and broader networks of social relations and economic inequalities. However, the rigor of the sourcing studies and their connections to communities of potting practice really shine as clear demonstrations of methodology and interpretation. Such a treatment of how socioeconomic power relations are evidenced by ceramic production is a valuable contribution to historical archaeological reasoning that should prove a benchmark for similar studies in Americanist settings.

Archaeological Concepts for the Study of the Cultural Past.

Alan P. Sullivan III (editor). The University of Utah Press, Salt Lake City: 2008. viii +168 pp., 41 figures, 5 tables, index. Price: US\$55.00 (cloth), ISBN 978-0-87480-922-0; US\$25.00 (paper), ISBN: 978-0-87480-916-9.

Reviewed by Greg Schachner, University of California, Los Angeles, Department of Anthropology and Cotsen Institute of Archaeology, 341 Haines Hall – Box 951553, Los Angeles, CA 90095-1553, USA.

Archaeological Concepts for the Study of the Cultural Past is a recent contribution to the Foundations of Archaeological Inquiry series published by The University of Utah Press that consists largely of edited volumes that address current topics in archaeological theory and practice. The volumes generally contain short, focused chapters by leading scholars that are often useful for inclusion in graduate and undergraduate courses and widely cited in professional literature. It would not be unreasonable to suggest that these are among the most widely read edited volumes in American archaeology, as they often approach topics of interest to a large audience with varying theoretical or areal interests. The production of low-cost paperback volumes certainly helps in this regard, and the press should be commended for its efforts to keep these volumes affordable.

Archaeological Concepts is no exception to the Foundations formula and is the product of a conference organized by Alan Sullivan and supported by the press that attempted to address the sometimes uncomfortable position of archaeology within the discipline of anthropology in the United States and its relationship with cultural anthropology in particular. Toward this goal, Sullivan "assembled a group of practicing archaeologists, each with different expertise, to analyze problems with the current disciplinary arrangement and to recommend changes in practice and pedagogy that might coalesce into a truly archaeological study of the cultural past" (back cover). Although each of the chapters accomplishes these goals to varying degrees, as a whole the volume outlines the

numerous accomplishments that archaeologists have made when considering the archaeological record on its own terms or borrowing ideas, theories, and techniques from disciplines other than anthropology.

In an overly brief Chapter 1, Sullivan outlines a few of the problems that he sees arising in archaeology in the U.S. due to its position as a subfield within anthropology. Many of these have been noted before, such as the fact that much of the cultural past that archaeologists study may have little or no relation to the cultural variation recorded by ethnographers or that cultural anthropologists rarely study the material phenomena that archaeologists rely upon to document past behavior. Sullivan also suggests that because most U.S. archaeologists are trained within anthropology programs, our concepts of the archaeological record are in fact undertheorized and our methodologies for understanding that record are underdeveloped. Most of the rest of the volume is devoted to identifying aspects of archaeological practice that have moved beyond the theories and methods of cultural anthropology to enhance our understanding of the past. Although I have little to argue with in terms of Sullivan's basic premise, I would have liked to have seen a bit more exploration of why this disciplinary structure arose in order to understand its effects on archaeology. For example, many would argue that how archaeology is practiced today, the types of questions we ask, the techniques we choose or are allowed to use, and even our relationship with other subdisciplines is still at least in part determined by the early focus of anthropology in the United States on the study of American Indians.

Chapter 2, also by Sullivan, proposes that an uncritical reliance on ethnographic analogy encourages archaeologists to focus on a limited portion of the full archaeological record, to overlook material remains and patterns that don't fit our expectations based on ethnographic accounts, and to force archaeological patterns to fit into flawed ethnographic models (also see Chapter 3). As an illustration, Sullivan outlines some of his work in the Grand Canyon area of northern Arizona, where he has identified past cultural behaviors, such as heavy reliance on wild foods and intensive, permanent occupation of small structures, that are at odds with prior studies that interpreted Grand Canyon archaeology in light of historic period Hopi ethnography.

Chapters 3, by Paul Goldberg, and 4, by David Killick, address the underutilization of, and lack of institutional support for, geoarchaeology and archaeological science by archaeologists in the U.S. when compared to their British and other European peers. Both authors outline a number of the increasingly important contributions these fields have made to archaeology and suggest that the fact that archaeology is part of anthropology, and as a consequence part of the lesser-funded social sciences in the U.S., has hindered their development here. Killick presents a damning perspective on the lack of knowledge about archaeological science among both archaeologists and cultural anthropologists and the pernicious lack of funding in comparison to other countries. In both chapters, the authors note that many U.S. scholars lack opportunities for training and that our current teaching capacity is severely underdeveloped. Although funding is certainly a major factor here, I think some of these problems arise because many archaeologists have a difficult time keeping up with such

rapidly developing fields that often require at least some technological expertise. One small step to remedy these shortcomings may be increased emphasis on, and institutional support of, continuing education opportunities, such as the NPS supported workshops on remote sensing, for archaeologists of all skill and degree levels. Greater participation in these efforts could aid training and research in the archaeological sciences by allowing non-specialists to keep pace with these fields.

Chapters 5 (Kenneth Kvamme), 6 (Harold Dibble), and 7 (Julie Stein) focus on the use of remote sensing techniques, lithic analysis, and concepts of provenience, respectively, as they aid in the interpretation of the archaeological record. Although these are very different concepts and methodologies, all share roots outside of anthropology and require techniques, interpretative frameworks, and skills that do not have good analogues within cultural anthropology. Each chapter is an excellent historical summary of the development of these methodologies (especially Dibble's) and could serve as a brief overview for students or non-specialists. These authors address Sullivan's charge to address current disciplinary arrangements and the future to varying degrees, in part because I think they see the need for working with techniques and methodologies from outside cultural anthropology largely as a product of the unique materials archaeologists study, rather than as a flaw in the anthropological project, a view with which I concur.

Chapter 8, by James Enloe, and 9, by Michael Deal, address the development of methods and theories that allow archaeologists to interpret patterning found in the archaeological record. Enloe's chapter discusses his use of techniques and insights from various disciplines, including ethnoarchaeology, geomorphology, ecology, and anatomy to interpret spatial patterning at the European Paleolithic site of Pincevent. Deal's chapter examines the development of what for lack of a better term might be called abandonment theory by archaeologists. The study of abandonment, both in the modern world and the past, has been largely the domain of archaeologists and has largely proceeded outside of the concerns of mainstream cultural anthropology. Again, as with many of the authors, Enloe and Deal appear to see the cleavage between cultural anthropology and archaeology primarily as a matter of methodology and data, rather than theory or goals.

Overall, I think the volume is a worthwhile member of the Foundations series and certainly would consider recommending individual chapters to colleagues or assigning them in class. Although I, as well as many of the chapter authors, am perhaps less concerned about our current disciplinary arrangement than others, U.S. archaeologists should continue to critique current arrangements in order to identify underdeveloped parts of the discipline, methods, or theories that arise from our particular (peculiar?) disciplinary training. For example, one undeveloped thread in the current volume that deserves further exploration is how the current disciplinary arrangement affects the preparation of archaeologists for cultural resource management careers, which now comprise the vast majority of opportunities for archaeologists in the U.S. The authors of the volume are to be commended for their discussion of a critical, and often unexamined topic, that affects our discipline in numerous ways.

Employment Positions and Fellowship and Research Opportunities

The University of New England is seeking a **palaeo/biological anthropologist**, or **archaeologist**, with an active research program in the Asian, Australasian or Pacific regions. Applicants must be able to contribute to the discipline's focus on the origins, evolution and dispersion of humans in the nominated geographic regions as viewed from the archaeological record, human skeletal biology or other evidence. Teaching may include archaeology of the Asian Australian regions, field and laboratory skills, paleoanthropology, forensic anthropology, or primate ecology and behaviour. Applicants must have a PhD in one of these fields and an active research profile. The successful applicant will be expected to develop innovative approaches to the teaching of the discipline to internal, external and on-line students as part of a team. The position will commence in July 2010. Informal enquiries may be directed to Professor Lynda Garland, Head, School of Humanities phone: +02-6773-2794 or email: lgarland@une.edu.au or Dr Peter Grave, Discipline Convenor, phone: +02-6773-2062 or email: pgrave@une.edu.au.

The University of Pittsburgh invites applications for a one-year position (academic year 2010-11) as **Visiting Scholar** in the newly founded Center for Comparative Archaeology (www.comparch.pitt.edu), in the Department of Anthropology. The Visiting Scholar will be engaged in archaeological research that takes a comparative approach to long-term social change. S/he will help to lead an extended seminar on comparative research in archeology involving the theme of this research. The Visiting Scholar must have completed the doctoral degree by September 2010; inquiries from more senior scholars are also welcome. Applicants should submit, by 22 February 2010, a CV, the names of three references, and a letter of application (2-3 pp.) including a discussion of the research to be pursued. Ideas related to the integration of the research theme into the ongoing seminar on comparative archeology are also welcome. Inquiries and applications can be sent to Robert D. Drennan, Dept. of Anthropology, 3302 Posvar Hall, University of Pittsburgh, Pittsburgh, PA 15260, USA or to drennan@pitt.edu (no attachments larger than 1 Mb please).

Northwestern University Department of Anthropology invites applications for a senior position in the archaeology of complex societies, at the rank of **tenured associate or full professor**, to begin in Fall 2011. Geographical area and methodological focus open. Research on either historic or prehistoric periods will be considered. Candidates should have a strong record of publication and research, external grants, mentoring graduate and undergraduate students, and a commitment to a four-field approach in anthropology. Minorities and women are especially encouraged to apply. The deadline for the submission of application materials is 1 March 1 2010. Send a letter of application, a vita, and the names of three referees to: Elizabeth Brumfiel, Chair, Archaeology Search Committee, Department of Anthropology, Northwestern University, 1810 Hinman Ave, Evanston, IL, 60208-1310, USA.

Applications are invited for one PhD position (four years fully funded) to join the ARCHGLASS team as part of a European Research Council Starting Grant research project, lead by Prof. Patrick Degryse, Earth and Environmental Sciences, Katholieke Universiteit Leuven (Belgium), in collaboration with international research groups. A **PhD researcher** is expected to carry out the subproject on the mineralogical and geochemical characterisation of flux mineral resources used in glass production. This scholar brings together information on possible flux resources used for Hellenistic-Roman glass production, and studies glass from the point of view of B isotopes (in co-operation with both post-doctoral fellows) to identify possible multiple sources of fluxes. A MA or MSc degree in archaeometry, archaeological sciences or exact sciences (chemistry, physics, geology etc) is required. Experience in archaeological or archaeological sciences research is an advantage. For the PhD position, written applications should be addressed to Patrick Degryse and should include: a curriculum vitae, letter of motivation, and names for two academic references. The preferred start date is 1 October 2010.

The Elemental Analysis Facility at The Field Museum welcomes academic researchers and students who wish to collaborate with our scientists on the analysis of museum specimens or on topics of interest to our research group. Thanks to a NSF grant for Archaeometry for 2008-2011, the EAF will be able to subsidize a limited number of research projects primarily related to LA-ICP-MS analysis. Subventions will be available to offset lab costs and for graduate students to help with airfare and accommodation costs when coming from outside the Chicago area. Proposal must be received by 31 March and 30 September, each year. All parties who wish to undertake a collaborative project in the lab should forward a short proposal (2-4 pages) for consideration. The proposal should address the research problem, the size of the specimens, and the type, number, and contexts of the samples. Curriculum vitae for the principal collaborator(s) should also be included. Proposals for projects of interest that cannot be funded through the NSF grant can be submitted and will be considered on a case-by-case basis. Email: ldussubieux@fieldmuseum.org or fax: 312-665-7193.

Upcoming Conferences

Rachel S. Popelka-Filcoff, Associate Editor

2010

19-20 February. Computer Applications in Archaeology UK. London, UK. General information: <http://unstan.arch.ucl.ac.uk/caauk/>. Abstract deadline 27 November 2009.

22-26 February. 2010 Ocean Sciences Meeting. Portland, OR, USA. General information: <http://www.agu.org/meetings/>.

10-12 March. 40th Annual International Arctic Workshop, Winter Park, CO, USA. General information: <http://instaar.colorado.edu/AW/about/index.html>.

21-25 March. 239th ACS National Meeting & Exposition. San Francisco, CA, USA. General information: <http://acs.org>.

6-9 April. Annual Conference on Computer Applications and Quantitative Methods in Archaeology: "Fusion of Cultures". Granada, Spain. General information: <http://www.caa2010.org/>.

12- 16 April. 7th International Congress on the Archaeology of the Ancient Near East. London, UK. General information: <http://www.7icaane.org/>.

14-17 April. American Association of Physical Anthropologists Annual Meeting. Albuquerque, NM, USA. General information: <http://physanth.org/annmeet/>. Contact: Lorena Madrigal, madrigal@cas.usf.edu.

14-18 April. Society for American Archaeology 75th Anniversary Annual Meeting. St. Louis, MO, USA. General information: <http://www.saa.org/meetings/index.html>. Contact: meetings@saa.org.

14-18 April. Association of American Geographers. Washington DC, USA. General information: <http://www.aag.org>.

14-18 April. Paleoanthropology Society Meetings, held in conjunction with the Society for American Archaeology. St. Louis, MO, USA. General information: <http://www.paleoanthro.org/meeting.htm>.

22-23 April. All at Sea? Synergies between past & present coastal processes & ecology. Loughborough University, UK. General information: <http://www.lboro.ac.uk/departments/gv/allatsea/location.html>.

23-25 April. 14th Symposium on Mediterranean Archaeology. Kiev, Ukraine. General information: <http://www.genama.info/soma2010/index.html>

29 April - 1 May. International Congress on Archaeological Sciences in the Eastern Mediterranean and the Near East (ICASEMNE). Paphos, Cyprus. General information: <http://icasemne.net/>

2-7 May. European Geosciences Union. Vienna, Austria. Several sessions with archaeological/anthropological themes. General information: <http://meetings.copernicus.org/egu2010/>.

10-14 May. 38th International Symposium on Archaeometry (ISA 2010). Tampa, FL, USA. General information: <http://isa2010.cas.usf.edu/> Contact: Robert Tykot, rtykot@cas.usf.edu.

24-26 May. Youth in Conservation of Cultural Heritage (YOCOCU 2010). Palermo, Italy. General information: <http://www.yococu.com/>.

6-11 June. 2010 SEA-CSSJ-CMS Trilateral Meeting on Clays. Madrid, Spain. General information: <http://www.sea-arcillas.es/2010TMC/>.

12-18 June. Goldschmidt 2010 – "Earth, Energy and Environment". Knoxville, TN, USA. General information: <http://www.goldschmidt2010.org/>.

21-25 June. XIII International Conference on Ground Penetrating Radar. Lecce, Italy. General information: <http://www.ibam.cnr.it/gpr2010/>.

28 June - 2 July. GeoRaman 2010 - 9th International Conference on Raman Spectroscopy. Sydney, Australia. General information: <http://georaman2010.com/default.html>.

1-6 August. 19th World Congress of Soil Science. Brisbane, Australia. General information: <http://www.ccm.com.au/soil/>.

2-6 August. 59th Annual Denver X-ray Conference. Denver, Colorado, USA. General information: <http://www.dxcicdd.com/>.

21-27 August. 20th General Meeting of the International Mineralogical Association. Budapest, Hungary. General information: <http://www.ima2010.org/>.

22-26 August. 238th National Meeting and Exposition, American Chemical Society. Boston, MA, USA. General information: <http://www.acs.org>.

23-28 August. 11th International Conference, International Council for Archaeozoology. Paris, France. General information: <http://www.alexandriaarchive.org/icaz/ICAZ2010/ICAZ%202010%20-%20home%20page.htm>.

16-18 September. International Aerial Archaeology Conference, AARG 2010. Bucharest, Romania. General information: <http://www.univie.ac.at/aarg/php/cms/>.

23-26 September. XIX Congress of the Carpathian Balkan Geological Association, Thessaloniki, Greece. General information: <http://www.cbga2010.org/>.

6-9 October. Plains Conference. Bismarck, ND, USA. General information: <http://www.ou.edu/cas/archsur/plainsanth/meeting/meeting.htm>.

31 October - 3 November. The Geological Society of America National Meeting. Portland Oregon, USA. "Reaching New Peaks in Geoscience". General information: <http://www.geosociety.org/meetings/>.

12 November. Program on Ancient Technologies and Archaeological Materials Science and Archaeology Symposium. Urbana, IL, USA. General information: <http://www.itarp.uiuc.edu/atam/index.html>

17-20 November. American Schools of Oriental Research Annual Meeting. Atlanta, GA USA. General information: <http://www.asor.org/am/index.html>.

1-3 December. Association for Environmental Archaeology (AEA) Annual Conference. Kyoto, Japan. General information: <http://www.envarch.net/events/index.html#Kyoto>.

2011

7-11 January. The International Biogeography Society 5th International Conference. Crete, Greece. General information: <http://www.biogeography.org/html/Meetings/index.html>.

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Newsletter of the Society for Archaeological Sciences

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Published quarterly by the Society for Archaeological Sciences

Distributed to subscribers: \$20/yr regular membership; \$15/yr student and retired; \$30/yr institutional; \$300 lifetime. Individuals add \$110/yr for *Journal of Archaeological Science*; \$40/yr for *Archaeometry*. ISSN 0899-8922.