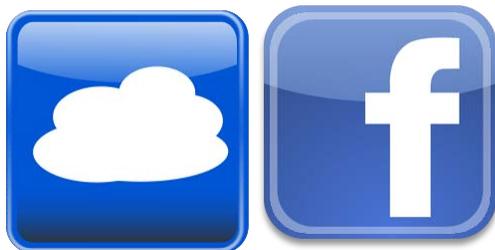


SAS BULLETIN

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APRIL SHOWERS BRING BIG CHANGES

Spring is in the air, at least in most parts of the Northern Hemisphere. It is typically a time of change, whether in temperature or around your house. A number of developments occurred at the 2011 Business Meeting of the Society for Archaeological Sciences (held in April in Sacramento, California) as well.

Among the decisions made by the attendees was that online access to the *SAS Bulletin* is now simultaneous with publication. The print edition, of course, will still be mailed to you, at least for the foreseeable future. Some people like the feel of turning paper pages, institutions appreciate holding copies for distribution, and certain members may not have the internet infrastructure that allows them the freedom and flexibility to access the web version at their convenience.

On the other hand, much of the information contained within these pages is time sensitive. You should find plenty of meeting and conference details in this issue (as you do in all the issues). But some of the deadlines may have passed while the *Bulletin* was in the mail. Further, the underlined text you see in the printed version are active links in the .pdf files stored here: <http://www.socarchsci.org/sasb.html>.

Unafraid of technology, SAS is now also on the social networking site “facebook.” Consider

becoming our friend there. This is an attempt to broaden our capabilities with regards to distributing announcements and recruiting more members to the organization. It should be a nice counterpart to the SAS Blog (<http://socarchsci.blogspot.com/>) and wiki (<http://sites.google.com/site/saswiki/>). Both of these pages are excellent resources for students, faculty, researchers, scientists, and other interested parties. They hold the most up-to-date details about archaeometric news items, conferences, job announcements, laboratories, and funding opportunities.

And speaking of money, the SAS is now offering the Student Research International Travel Award. This grant will support international trips for laboratory or field-based research to undergraduate and graduate students. Up to US\$1000 is available to help defray the costs of studying in another country. The award is only given to individuals who have been SAS members for more than one year. Visit <http://socarchsci.org/Student%20Research%20Award.pdf> for the fine print.

Finally, the spirit of transition has also hit the Executive Board of SAS. The new President, Patrick Degryse, now holds the gavel. Robert Tykot was announced as the President-Elect and Vice President. Both officers have been involved with SAS for some time, but their new leadership means the organization will change, much like the current season.

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ANNOUNCEMENTS

Awards

The ***R. Ervin Taylor Student Poster Award Competition*** at the 2011 Society for American Archaeology Annual Meeting yielded many interesting and innovative contributions to the use of scientific technology to archaeological research. The winner was Alyson Thibodeau from University of Arizona (with John Chesley and Joaquin Ruiz) for the illuminating poster “*Determining the source of turquoise at Pueblo Bonito, Chaco Canyon, New Mexico.*” Abstract: The geologic source (or sources) of turquoise found in the Great Houses of Chaco Canyon, New Mexico has been the subject of speculation for over a century. For the first time, high precision lead and strontium isotopic analyses have been applied to over 25 raw, partially worked, and finished turquoise objects recovered from the canyon’s largest Great House, Pueblo Bonito. The data from these turquoise artifacts are compared to the lead and strontium isotopic signatures of 18 major areas of turquoise mineralization in New Mexico, Colorado, Arizona, California, and Nevada and the sources represented by these objects are revealed.

Honorable mentions were given to two other scholars, Amy Commendador and Paul Szpak. Ms. Commendador, from the Idaho Museum of Natural History (with Bruce Finney and John Dudgeon), was recognized for the remarkable presentation “*Isotopic Analyses of Small Mammals from the Wasden Site, Idaho as Indicators of Climate Change on the Eastern Snake River Plain.*” Abstract: Previous research on the small mammal population recovered from excavations at the Wasden Site, southeastern Idaho suggests that changing frequency distributions through the Holocene represent a shift in climate from a cooler, wetter regime to a warmer, drier one. This conclusion is re-evaluated using carbon and nitrogen isotope analyses of bone collagen from the two primary species of small mammals from the previous studies: pocket gophers (*Thomomys talpoides*) and pygmy rabbits (*Brachylagus idahoensis*). Isotopic evidence from the small mammal distribution over time may help refine current models for climate change, by providing alternate forms of evidence to test these hypotheses.

Mr. Szpak, from University of Western Ontario (with Jean-Francois Millaire, Fred Longstaffe, and Christine White) exhibited a fascinating poster on “*Effects of*

Seabird Guano Fertilization on the Stable Isotope Composition and Growth of Maize (Zea mays): Results from a Controlled Study.” Abstract: Seabird guano from the arid western coast of South America was one of the most widely used fertilizers in the nineteenth century, although its importance in prehispanic agricultural systems has been difficult to determine. This paper presents data from a controlled study of maize fertilized with Peruvian seabird guano, outlining the effects of different fertilization regimes on maize growth and isotopic composition (d13C and d15N). We discuss the implications of this study for the identification of guano fertilization through isotopic analysis of archaeological materials.

New Conference

GlobalPottery 1st International Congress on Historical Archaeology and Archaeometry for Societies in Contact (<http://www.ub.edu/gracpe/arqub/GlobalPottery/>)

The Cultura Material i Arqueometria UB (ARQUB, GRACPE) research unit at the Universitat de Barcelona, along with the members of the Tecnolonia research project, has the pleasure of inviting you to the GlobalPottery 1st International Congress on Historical Archaeology and Archaeometry for Societies in Contact.

The Congress will be held at the Aula Magna of the Facultat de Geografia i Història of the Universitat de Barcelona in January, 25-27, 2012. This recently built venue represents the state-of-the-art on conference rooms, providing with ample seating space and technical resources towards the success of the oral and poster communications, as well as classrooms and computer rooms, where working sessions could take place. The building is located in the historical quarter, in the city centre, and a wide variety of historical, cultural, gastronomical, and leisure opportunities are available within walking distance.

Up to now, there has been an important gap in the scholar community where specialists could discuss and define new trends on the field of ceramic studies in Historical Archaeology for societies in contact. This gap is even more evident considering the limited number of projects embracing archaeological and archaeometrical methodologies that could serve for the development of interdisciplinary based knowledge.

The aim of GlobalPottery is to fill this gap, providing scholars with a specialized international forum that deals with Historical Archaeology ceramic studies, primarily including the so-called topics of *Post-Medieval*

Archaeology and Later Historical Archaeology or *Industrial Archaeology*. It is also the aim of GlobalPottery to promote the studies on societies in contact, bearing in mind that the colonization of America and the first World circumnavigation must be considered the beginning of the present Global World.

The Congress will contribute to the promotion of the development of multidisciplinary archaeological and archaeometrical research in order to generate historical knowledge from the extant ceramic record of the Cultural Heritage.

The conference sessions will be classified according to geographic topics, which will be introduced by an invited speaker. Each session will accept oral and poster communications. Poster communications will be scheduled in poster sessions accordingly.

Invited speakers will be chosen following international excellence and visibility criteria, as well as a balance between Archaeology and Archaeometry. According to the impact and nature of the conference, the capacity for attracting international contributors will be amongst the main motivations for their selection.

GlobalPottery aims to create a real space for scholar discussion. In this way, the presence of archaeological materials, archaeometric samples and results is encouraged. The Congress will provide binocular and petrographic microscopes, as well as facilities, for enabling archaeological and archaeometrical observations and discussions by the participants.

The official language of the conference will be English. Exceptions will be considered in a case by case basis. A peer-reviewed book publication will be published collecting the conference communications.

Deadline for submission of abstracts: July 31, 2011.
Notification of acceptance or rejection: mid September 2011. Deadline for registration and payment: November 30, 2011. Sessions: January 25th - 27th, 2012

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Fellowship Opportunity

Philippe Sciau at Université de Toulouse is looking for a student (Masters level from outside France) to submit a proposal for a *PhD fellowship*. The subject of thesis is the study of ancient ceramics through the development of a methodology based on multi-scale analysis.

Here is the call for participants: In collaboration with our Californian colleagues, the multi-scale analytical approach developed at Toulouse (CEMES, TRACES) allowed us to obtain innovative results on Roman Terra Sigillata. Our goal is now to go further in developing the methodology to better understand the cultural heritage materials' heterogeneity thanks to a split in simple and partially independent sub-systems. With the confrontation between data from our different systems, we hope not only to retrieve the composition and the heterogeneity of the initial melting, but also to obtain pertinent information about the thermal treatment (cycles, temperatures, atmospheres). This requires a chemical and structural multi-scale study adapted to the object's heterogeneity, it means a micrometre scale analysis in order to identify and delimit the diverse sub-systems, and then at the nanometre scale to determine the composition of each sub-systems. The nanometre scale is also essential to study the interaction zones between the different sub-systems. Our aim, in the framework of our larger project, is to develop this methodology by using the equipment available at CEMES (Raman spectroscopy and transmission electron microscopy) and the possibilities of the micro-beamline of the Californian synchrotrons (ALS, SRRL), and especially the potential of hard X-ray full-field transmission X-ray microscopy at SSRL. This new approach will be applied to various archaeological issues concerning the decorative surfaces of ancient ceramics in collaboration with archaeologists from Toulouse le Mirail University (TRACES lab).

This PhD opportunity does not come with automatic funding for students. The candidate will have to apply and be accepted to the PhD program. Once accepted, the candidate will apply for a scholarship and compete in the annual PhD pool. We believe that if the candidate has a strong dossier that the chances of receiving a scholarship are very good.

Visit the following site for more details and contact info: http://www.adum.fr/as/ed/voirproposition.pl?langue=&site=edsdm&matricule_prop=2748

ARCHAEOLOGICAL CERAMICS

Charles C. Kolb, Associate Editor

The column in this issue includes five topics: 1) Reviews of Books on Archaeological Ceramics; 3) Online Resources; 4) Previous Meetings; and 5) Forthcoming Meeting.

Book Reviews

Vitreous Materials in the Late Bronze Age Aegean: A Window to the East Mediterranean World, by Caroline M. Jackson and Emma C. Wager (eds.), Sheffield Studies in Aegean Archaeology 9, Oxford: Oxbow Books, 2008. xxiii + 242 pp., 27 black-and-white figures, 28 color plates, 9 tables; ISBN 13 978-1-84217-261-2, ISBN-10: 1-84217-261-1, \$64.00 (paperback). This volume has an introduction that provides context to the subsequent ten chapters; there is no index. The color plates are grouped in one section following p. 233; each chapter has its own references. There is a list of 29 “Abbreviations” (p. vii), mostly journals; a “List of Contributors” (p. viii-ix), n = 19; and a “Chronological Chart – Egypt and Crete” (p. x) by Jacke Phillips that covers the period 2800-1100 BC. The editors, Caroline M. Jackson and Emma C. Wager, prepared an important “Introduction: Vitreous Materials in the Late Bronze Age Aegean: A Window to the East Mediterranean” (pp. xii-xxiii, 28 references) in which they provide the context for the subsequent papers and cluster them into four groups: 1) production and origins, 2) the impact of innovation, 3) cross-craft interaction, and 4) the value and significance of vitreous materials. The contributions are from a January 2005 conference, the 9th annual Round Table of the Sheffield Centre for Aegean Archaeology, which had as its focus “Vitreous Materials and Technology in the Bronze Age Aegean.” Attendees included 13 from the United Kingdom, four from Greece, and one each from Austria, Germany, and the United States. Brief summaries of the contributions follow.

Paul T. Nicholson, “Glass and Faience Production Sites in New Kingdom Egypt: A Review of the Evidence” (pp. 1-13, 2 figures, 33 references). The author discusses evidence for glass production at six sites: Malkata (near Luxor, 1390-1295 BCE), Amarna Site 045.1” (1352-1231 BCE), Memphis (workshops not yet discovered), Lisht (on the Nile east bank between Meidum and Dashur), and Mensigeh (in Upper Egypt). Faience production sites are located close to “royal” sites, but glass-making sites are complicated to discern. Nicholson comments that we need to think of a “vitreous material industry” rather than separate glass and faience production sites. Thilo Rehren and Edgar B. Pusch, “Crushed Rock and Molten Salt?

Some Aspects of the Primary Glass Production at Qantir/Pi-Ramesse” (pp. 14-33, 2 figures, 4 tables 11 color plates, 42 references). The potential use of natron for glass-making is considered for New Kingdom Egypt (Late Bronze Age). There are three sites in the eastern Nile Delta that have mixed assemblages containing grey parting layers and semi-finished glass. Silica sources (citing Shortland’s work) have been examined using XRF to distinguish finely crushed quartz powder and semi-finished glass. SEM-EDS data is also assembled and the authors consider a possible fluid soda phase in the manufacture. The research confirms that the semi-finished glass has crushed quartz as the primary silica source (likely quartz pebbles were the raw material), and they note problems in indentifying LBA glass production loci.

Marina Panagiotaki, “The Technological Development of Aegean Vitreous Materials in the Bronze Age” (pp. 34-63, 15 color plates, 119 references). Six types of vitreous materials are distinguished as part of the author’s “Aegean Vitreous Materials Project” (AVMP) research; but none of the types were mass-produced. She traces the development of Aegean vitreous materials from the third to the end of the second millennium BCE and discusses Laser-induced Breakdown Spectrography (LIBS) work and the technical and compositional aspects of vitreous materials from Crete and Egypt (Pre-Palatial period scarabs, Palatial period plaques and meads, relief work, and vases). Workshops were located at Knossos and Zakros. Late Palatial period (LMIA-B) glass included vases, figurines, beads, plaques, and rhyta. Panagiotaki also reviews the uses and social implications of glass production, ritual and funerary contexts, and states that faience may have been a “cheap substitute for precious stones” (p. 54). An appendix documents the AVMP’s analytical work (SEM, EDS, MAS, LA-ICP-MS, and XRF), conservation efforts, and replication work. Georg Nightingale, “Tiny, Fragile, Common, Precious. Mycenaean Glass and Faience Beads and Other Objects” (pp. 64-104, 11 figures, 140 references). Late Bronze Age Aegean types and uses of faience and glass beads during the Mycenaean Palatial period are reviewed, notably glass inlay, relief beads, stamped beads, plaques, figurines, and seals. Imported glass from northern Europe and the Near East are noted. He observes that the actual production methods for creating Mycenaean glass beads have not been determined (p. 76). Uses and meanings include funerary rituals, magic and supernatural (both life and death contexts seem likely). Exports of Mycenaean glass and faience beads to Cyprus, the Levant, Italy, Sicily, and Sardinia are documented, in the main, via shipwreck evidence. He also discusses the fact that that glass and faience production did not survive the

end of the palaces and the “Dark Ages” (LH IIIB, ca. 100 BCE). Appendices summarize materials analyses and tabulate the larger glass objects (bowls, swords, daggers, hilts, helmets, and pins).

Michael Tite, Andrew Shortland, Gareth Hatton, Yannis Maniatis, Despina Kavoussanaki, Mathilda Pyrli, and Marina Panagiotaki, “The Scientific Examination of Aegean Vitreous Materials - Problems and Potentials” (pp. 105-125, 4 figures, 4 tables, 40 references). The authors review evidence for glass production for the period from the third millennium BCE to 15th century BCE with the aim to identify raw materials used in the production of faience, Egyptian blue, frit, and glass. They also endeavor to locate the sources of the raw materials. Analytical techniques (SEM-WDS, SEM-EDS, and LA-ICP-MS) reveal evidence on quartz, alkali flux, lime, and colorants. Minoan and Mycenaean faience, Egyptian blue frit, and Mycenaean glass are reviewed, and the authors lament the problems of weathering and the loss of compositional data, the issue of Egyptian imports, and the unknown origins of cobalt and copper. Helen Hughes-Brock, “Relief Beads and Glass Seals: Design and Craftsmen” (pp. 126-150, 4 figures 2 color plates, 104 references). The author examines chronologically data on beads and seals from EBII through MMIII-LMI in Minoan Crete and the Mycenaean world using SEM. She reviews examples of the objects, their motifs (domestic and foreign), workmanship, casting in molds, and the use of gold leaf in relief beads. The may have been specialists (carvers and glass-workers) but how these artifacts were used and by whom is not entirely clear.

John Bennet, “Palace™: Speculations on Palatial Production in Mycenaean Greece with (Some) Reference to Glass” (pp. 151-172, 85 references). Bennet provides an historical perspective for Late Helladic II (ca. 1700-1400 BCE) and discusses his assumptions about the existence of palaces and that glass was acquired as a raw material. Early Mycenaean industries produced elite objects in faience and bronze within an institutionalized “palatial environment” and were used in ceremonies and became heirlooms. The Late Palatial period was a time when there were small numbers of attached craft specialists (potters, horn workers, textile makers, and producers of perfumed olive oil and wine). He reviews production terminology from a Linear B document, noting linguistic distinctions in glass-making (blue glass and lapis) and motifs, and the uses of beads, seals and signets. Karen Polinger Foster, “Minoan Faience Revisited” (pp. 173-186, 63 references). Foster examines her 1979 volume, *Aegean Faience of the Bronze Age* (New Haven: Yale University Press), in the light of new

studies, and focuses on three areas of inquiry: 1) artistic, 2) geopolitical, and 3) religious. She reviews evidence of faience in intellectual and artistic aspects of Minoan art, and her initial assumption that faience as an inexpensive substitute for lapis and turquoise; she also corrects an error in scientific analysis from 1979 (Mn rather than Mg in the chemical composition). The Town Mosaic from Knossos with inlays in furniture is reinterpreted as depicting a change in political leadership. Lastly she addresses the question as to why there were so many faience objects in the Temple Repositories at Knossos, noting that color and brilliance may relate to magical qualities, fecundity, and divinity. Foster concludes that faience figurines were not divine but represented mortal women.

Mark Peters, “Colour Use and Symbolism in Bronze Age Crete: Exploring Social and Technological Relationships” (pp. 187-208, 4 figures, 1 table, 69 references). Peters reviews the basics of color perception, symbolism, and technology, including the roles of color and color theory in archaeological research, with posited social relationships as seen in Egyptian and Minoan art. He discusses color and “control of the natural world,” color palettes and frequencies (there is a notable increase in the use of blue over time with ground azurite giving way to Egyptian blue), and color in the crafts of lapidary and pottery, as well as pigments and social significance. He also considers potential copper and bronze metallurgical associations and concludes that greens are associated with death and decay, while blue is associated with positive transformations such as life, and rebirth. Susan Sherratt, “Vitreous Materials in the Bronze and Early Iron Ages: Some Questions of Values” (pp. 209-232, 72 references). The author reviews definitions of vitreous materials (such as Freestone 1997) and relationships to precious stones, faience, and the ersatz nature of man-made material. She considers six regions chronologically: 1) Early second millennium eastern Mediterranean: faience beads and lapis inlays; 2) Late Prepalatial Crete: “white pieces” such as scarabs and seals; 3) Eighteenth Dynasty Egypt: “real” and “royal” art, glass seals, and inlays; 4) Later Late Bronze Age Aegean: molded glass ornaments and seals; 5) Faience in the second millennium Aegean; and 6) Faience in first millennium Lefkandi: the Toumba cemetery art. The values of vitreous materials changed diachronically from rare and precious to commonplace. Faience, she believes, “stood between metal and pottery in value” (p. 222).

This specialized volume is a valuable contribution to studies of vitreous materials and especially to Late Bronze Age Aegean archaeology. Overall, the papers combine perspectives from archaeology, art history

philology and archaeological science, some of the latter documented in appendices.

Archaeological Ceramics: A Review of Current Research, edited by Simona Scarcella, British Archaeological Reports International Series S-2193, Oxford: Archaeopress, 2011. ii + 175 pp., 144 figures, 1,043 references, ISBN 978 1 4073 0748 0, £36.00 (paper). The 14 contributions to this volume (supplemented by a contextual introduction and an essay) are, in the main, from revised oral papers presented at the 15th Annual Meeting of the European Association of Archaeologists (EAA) held in Riva del Garda (Trento, Italy) 15-20 September 2009. Simona Scarcella, EHESS: École des hautes études en sciences sociales (School for Advanced Studies in the Social Sciences), TRACES, UMR, Toulouse, France, organized a session that focused on the “*Chaîne opératoire* approach to ceramic studies” and sought to relate ceramic processes and cultural phenomena, and this monograph includes presentations from that meeting as well as solicited papers. She has now edited these contributions and grouped them into four thematic sections (the numbers of contributions in this volume are in parentheses): typology (2); archaeometry or archaeological science (5); experimental archaeology (5); and ethnoarchaeology (2). A majority of the presentations focus on European contexts (northeast Bohemia, Crete, Cyprus, northern England, southwest Iberian Peninsula, southern Italy, southern Romania, and Scandinavia) with the Near East (Iraq, Turkey, and Iran), the Russian trans-Urals, northwest Argentina, northern Peruvian Andes, and southern highland Mexico also represented. Chronologically, the Old World papers span the periods from the Mesolithic-Neolithic transition through the Chalcolithic, Bronze, and Iron Ages, plus contemporary potters; the New World papers focus on contemporary ethnoarchaeology with one on prehistoric ceramics dating CE 900-1200. The contributors are mostly Europeans but there are chapters authored by a Canadian (Michael Deal) and an Argentinian (Guillermo De La Fuente). Each contribution has its own references and there is no list of figures and no index. The “Introduction” by Simona Scarcella (pp. 1-4, 34 references) provides context and briefly summarizes the papers.

“*Chaîne opératoire* and ceramics: classifications and typology, archaeometry, experimental archaeology, and ethnoarchaeology” by Charles C. Kolb, Independent Scholar and National Endowment for the Humanities, Washington, DC, USA (pp. 5-19, 169 references). Kolb was asked by Scarcella to provide an introductory essay to this volume on current research on archaeological ceramics. He began his essay with an overview of clay and pottery and moved quickly to the *chaîne opératoire*

approach and similar paradigms. Over the past four decades, he stated that from a New World perspective, there have been three distinct, discernable and overlapping phases of archaeological ceramic research: 1) an initial phase concerned predominantly with the documentation of variables of pottery manufacture, provenance, and physicochemical characterization; 2) a phase, derived in part from economic anthropology, with particular emphasis on the distribution and consumption of the finished products; and 3) a trend, building on the second phase, toward behavioral analyses and psychological meanings of the potters and their products. Through all three phases there has been a dynamic growth in the application of methods derived from the physical, biological, and nuclear sciences, so that the archaeometric toolkit has expanded dramatically in our ability, for example, to determine provenience and vessel contents. Kolb next reviewed the recent literature (mostly monographic) on eight topics: Classification and Typology; *Chaîne opératoire* and Ceramic Ecology; Mineral and Chemical Analysis/Archaeometry; Radiographic Analyses; Organic Residue Analysis; Absolute Dating; Experimental Archaeology; and Ethnoarchaeology. Lastly, he discusses “Some Thoughts on Analytical Procedures”: 1) Sampling Procedures; 2) Methodology (analytical methods and procedures employed); 3) Sample Size (archaeometrists often receive a select sample of specimens, sherds, whole vessels, or clays, which may not adequately represent the variances which actually exist in the specimens); 4) Measurement (discussions about petrographic and binocular microscopy and bulk INAA characterizations, and statistical and calculation errors; 5) Inconsistent Terminology (potentially leading to the misuse, or abuse of methodology, procedures, the data itself, and/or interpretations); 6) Source Material Changes (diachronic natural and cultural modifications); and 7) Clay Mixing.

Two contributions emphasized typological investigations. “Utilitarian and ritual pottery of the Gorokhovo culture: continuity and changes in an ancient society” by Sofya Panteleeva, Institute of History and Archaeology, Urals Branch of the Russian Academy of Sciences (pp. 20-29, 7 figures, 18 references). This chapter on Iron Age Gorokhovo culture of the Trans-Urals employs the traditional typological concept, illustrates the importance of utilitarian ceramics and decoration (incision and comb-stamping and undecorated vessels) in assessing issues of ethnicity, indigenous cultural development, mass migration, and cultural fusion. There are diverse cultural traditions represented within this forest-steppe territory and previous scholarly debates have focused on issues of formation, transformation, interaction and chronological correlation. The paper succeeds in clarifying some of these issues. Petrographic analysis is mentioned in the

narrative but not further elaborated. The ceramics that were analyzed came from burials in kurgans dated 4th-3rd centuries BCE but sample size is stated differently as 216 and 219 specimens. “Typological features of impressed ceramic within the stratigraphical sequence of the semicircular concentric ditches in the Neolithic village of Rendina (Potenza, Italy)” by Francesca Occhiogrosso, Università degli Studi della Tuscia di Viterbo, Italy (pp. 30-39, 7 figures, 18 references). Occhiogrosso’s paper concerns ceramic production and decoration (impressed, plastic, engraved, and painted) in the creation of a typology derived from 6,726 (also stated as 6,722 sherds) from stratigraphic excavations at the Early Neolithic village of Rendina, Potenza, in southern Italy. A macroscopic examination, not further detailed, revealed five pastes and the author also discusses firing. She was able to successfully create chronological subdivisions in the stratigraphy and define potential cultural changes. Notably, this is the only contribution in this volume that mentions calibrated radiocarbon dates used to determine chronology.

There are five papers on archaeometry or archaeological science. “Characterising surviving residues from archaeological ceramics: a biomolecular approach” by Cynthianne Debono Spiteri, University of York; Carl Heron, University of Bradford; and Oliver Craig, University of York (pp. 40-56, 4 figures, 177 references). The paper focuses on biomolecular studies, notably ORA (Organic Residue Analysis) employing Gas Chromatography, Gas Chromatography-Mass Spectrometry, and Gas Chromatography-Combustion-Isotope Ratio Mass Spectrometry (GC-MS, GC-C-IRMS) as methods of extraction to evaluate lipids and other residues. One case study considers the results of an examination of pottery with marine biomarkers (fish bones) dating to the Mesolithic-Neolithic transition in pottery the United Kingdom-Scandinavia. There are enlightening discussions on lipid chemistry and they also review lipid preservation and degradation, and a degradation experiment involving olive oil and milk, extraction methods, sampling issues, and the difficulties in working with plant residues. Simulation experiments were employed to study lipid decay processes. The authors conclude that there is great potential in the use of this method in determining human diets and food preferences. “Exploring the *chaîne opératoire* of ceramics through X-radiography” by Ina Berg, University of Manchester (pp. 57-63, 7 figures, 40 references). The *chaîne opératoire* and radiographic analyses (X-radiography) are a focus of Berg’s presentation. An assemblage of ceramics from Bronze Age Crete was used as a case study in her assessment in which she points out that X-radiography assists in characterizing clay fabrics (the composition and the nature of the clays used which

inform the selection process), identifying the primary forming techniques (an accuracy of 60-80% is reported), the attachment of spouts and appendages, the identification of repairs and breaks, and secondary forming techniques, surface treatments, and certain decorations. The potters employed two coexisting techniques, wheel-coiling and wheel-throwing during their early stages of experimentation but that wheel-made production appears limited to certain vessel forms and elite production is linked to elaborate designs. This reviewer notes that that the *tournette* may have been used keeping in mind that the rotating platform may not have been a wheel.

“The life-history of the potter’s wheel in the Ancient Near East” by Nicola Laneri, Istituto Italiano per l’Africa e l’Oriente (pp. 64-72, 4 figures, 68 references). This important paper concerns the origins of wheel-made ceramics, a debated topic in Near Eastern archaeology. The author draws upon Chalcolithic-Bronze Age (5th, 4th, and 3rd millennium BCE) data respectively from Ubaid, Iraq; Hacinebi Tepe, Turkey; and Shahr-i Sokhta, Iran, with emphasis on the Hacinebi assemblage of Late Chalcolithic Fine Ware vessels. Radiographic results suggest throwing on the hump in the production of elite ceramic products but its introduction was chronologically later for mass-produced forms. Combinations of wheel-throwing and hand-building and moulding techniques are also discussed. The analysis is synchronic but there is a need to enlarge the samples size and develop a diachronic approach in the assessment of the history wheel-throwing. Experimental research is also mentioned in this assessment of the socioeconomic organization of ceramic production. “From raw materials to utilisation: Ceramics associated with the metallurgical activity at Valencina De La Concepción (Seville, Spain): technological choices and social implication” authored by Nuno Inácio, Francisco Nocete, José Miguel Nieto, Moisés R. Bayona, and Daniel Abril, all from Universidad de Huelva, España (pp. 73-79, 10 figures, 24 references). The authors consider ceramic products (crucibles and *tuyères*) associated with copper metallurgy at Valencina de La Concepción, a site located in the southwestern Iberian Peninsula near Seville dated to the 3rd millennium BCE. Excavations produced specimens of minerals and slag, tools, and ceramic products. The authors employ a phalanx of scientific and archaeometric analyses -- textural, petrographic, chemical, and mineralogical analyses -- to characterize the manufacture and use of these ceramic products and reconstruct the technologies related to the use of these ceramics in metal production. The specimens analyzed included ten crucibles and four *tuyères*. There is a discussion of the regional geology, binocular and petrographic thin-section microscopy, relative porosity and the use of X-ray Diffraction,

Inductively Coupled Plasma-Mass Spectrometry, Inductively Coupled Plasma-Atomic Emission Spectroscopy (ICP-AES), and Scanning Electron Microscopy (SEM). They document the results of the studies: XRD (mineralogical characterization), ICP-MS (geochemical analysis for major trace and rare earth elements), ICP-OES (geochemical analysis for major trace and rare earth elements), and SEM (matrix and microstructural analysis, microtextural analysis, and sintering studies). The data allowed them to discuss the production process including the selection of raw materials, paste preparation, fabrication techniques, and estimate firing temperatures (based on mineralogical changes in the fabrics). It appears that the *tuyères* were produced in standardized cylindrical shapes and that the artisans were quite knowledgeable about the thermal properties of refractory clays (the source appear to be ca. 6 km distant). Although not explicitly stated, the concept of *chaîne opératoire* is employed. "Anthropological interpretation of ceramic assemblages: foundations and implementations of technological analysis" by Valentine Roux, UMR, Paris, France (pp. 80-88, 3 figures, 67 references). Roux examines "actualist studies" in ceramic technology (archaeological and ethnoarchaeological) and delves into the foundations and synchronic and diachronic variability of assemblages of the *chaîne opératoire*. In addition, he proposes a classification based upon the identification of: 1) technical groups, 2) techno-petrographic groups, and 3) techno-stylistic groups.

The subsequent set of five papers focus on experimental archaeology. "*Chaîne opératoire*, technical gestures and pottery production at Southern Andes during the Late Period (c. AD 900 – AD 1450) (Catamarca, Northwestern Argentina, Argentina)" by Guillermo De La Fuente, Universidad Nacional de Catamarca, Argentina (pp. 89-102, 15 figures, 55 references). The author's contribution to this volume focuses on Late Period (900-1200 CE) pottery from the Abaucan Valley, Catamarca, northwest Argentina and, like the paper by Inácio *et al.*, employs a variety of analytical methods. De La Fuente provides a splendid summary of the historical background and conceptual framework of the *chaîne opératoire* in his evaluation of regional development based on 15 sites in what appear to be chiefdom-level societies. The author discussed his methodologies and sample sizes in using binocular microscopy (1200 specimens), petrographic analysis (68 samples), Scanning Electron Microscopy-Energy Dispersive X-ray Spectroscopy (SEM-EDS), Raman Microspectroscopy (used to study vibrational, rotational, and other low-frequency modes), SEM-EDS, Raman Microspectrography, INAA (310 artifacts and 14 clays), and X-ray via Industrial Radiography (41 vessels and 1,197 sherds). In addition, there are studies involving

the experimental replication of bowl forms using coiling techniques, the *tournette*, and paddle and anvil; the sequential pictures of pottery-making are a valuable contribution to experimental archaeology and ceramic ethnoarchaeology. "An examination of emic possibilities: experimental archaeology and Cypriot ceramic typology" by Caroline Jeffra, University of Exeter (pp. 103-119, 23 figures, 25 references). Jeffra employs the *chaîne opératoire* approach with experimental archaeology to consider the earliest use of the pottery wheel by Bronze Age Cypriot potters. Her analysis focuses on an early typology developed by Paul Åströms that includes 275 types (including 93 jug types) within 11 wheel-made wares, among them Red Slip Wheel Made Ware and Black Slip Wheel Made Ware. Vessel shape, neck forms, and decoration are examined macroscopically and she addresses three relationships: 1) typology and forming techniques; 2) ware classification and forming technologies; and 3) shaping hierarchy and forming technology. Technologically-derived data brings the researcher's interpretations closer to internally-established, emic systems of categorization used by the pottery maker and inform the task of creating meaningful typological divisions. "From clay to sherd: understanding the manufacture, use and taphonomy of prehistoric ceramics by experiment" by Dana Millson, University of Durham (pp. 117-127, 8 figures, 63 references). The research presented in this chapter involves Late Neolithic-Early Bronze Age (3000-1600 BCE) pottery from the Tyne-Forth region of the United Kingdom. Six wares are described and the experimental replication of 72 Collared Urn vessels (made under the direction of a professional potter). Cooking performance was tested by boiling water in replica vessels that their interiors sealed with beeswax. In addition, in a study of ceramic taphonomy, 11 vessels were buried in two locations (Northumberland and Ontario) and re-excavated after 11 months and deteriorations noted, and residue analysis and isotopic analysis are mentioned.

"Experimental reconstruction of the pottery firing process of Late Bronze Age pottery from North-Eastern Bohemia" co-authored by Richard Thér, University of Hradec Králové, Czech Republic, and Miloš Gregor, Comenius University, Bratislava, Slovakia (pp. 128-142, 24 figures, 70 references). This important contribution focuses on the Late Bronze Age of northeastern Bohemia in central Europe and involved field experiments and archaeometric analysis. A variety of replica ceramic vessels were constructed and fired in 50 experimental firings including bonfires and seven types of kilns; time and temperature profiles were created and are presented in the paper. Macroscopic and mineralogical and petrographic analyses were undertaken on 5,207 sherds; firing conditions were estimated and six colors defined.

The overall temperature range of 700-1100° was estimated for 27 samples of original pottery and 28 specimens of experimental pottery. Eight photomicrographs help to illustrate changes that took place in temperature ranges. “Ritual chains” by Dragos Gheorghiu, Department of Research, National University of Arts, Bucharest, Romania (pp. 143-146, 2 figures, 29 references). The author’s goal is to introduce scientific analyses into the ritual field through the *chaînes opératoires* and experiments with updraft kilns. He noted that material and immaterial actions by the potter are significant variables, such as time of firing (daylight vs. nighttime), ambient temperatures, and wind velocities. This brief summary is a prelude to an in-press chapter on ritual technologies.

There are two chapters on ethnoarchaeology. The contributions by Deal and Ramón Joffre, both focusing chronologically on the ethnographic present, offer different perspectives on the topic of ceramic ethnoarchaeology: comparative information of pottery production in two different areas of the world, and an analysis of part-time, seasonally migratory potters. In “Microtraditions and agency in domestic pottery production: an ethnoarchaeological perspective” by Michael Deal, Memorial University, St. John’s, Newfoundland, Canada (pp. 147-159, 17 figures, 86 references). Deal compares the roles of potters in households from Mexico (Tzeltal Maya, 34 households in two villages) and Cyprus (14 potters in three villages); he has published a book on his Mesoamerican ethnoarchaeological work (Deal 1998). In this chapter, Deal employs the *chaîne opératoire* concept in his analysis of production locations, methods of fabrication, firing losses, ceramic reuses, agency and microtraditions. The potters use “time-proven” techniques but also incorporate recent innovations, and he discusses teaching and learning, and the important issue of clay mixing. “The swallow potters: seasonally migratory styles in the Andes” by Gabriel Ramon Joffre, British Museum, London (pp. 160-175, 14 figures, 80 references). The author focuses on the northern Peruvian Andes and so-called “swallow potters” who are seasonally migratory artisans. This practice of potting by itinerant potters occurs in the Andean region (southern Colombia, southern Ecuador, Peru, and western Bolivia) generally after these farmer-potters have brought in their main harvest. He has studied potters from 26 villages in four Peruvian provinces and provides six case studies that illustrate the “types” of potters and potting locations. These include potters traveling to different communities each year or annually to a single village, resettled or relocated potters, and herder-potters. Distances travelled, types of vessels produced, tools used, technical styles, and the division of labor are reported. Significantly, he

relates these ethnographic observations to archaeological materials and concepts and a migration pattern he terms the “culture of mobility.” He cites example of migratory potters in Korea, Tibet, Cyprus, Crete, Ethiopia, and northwest Pakistan. This typology provides a valuable tool for thinking about the pattern of itinerant potters and he states that the study “demonstrates a truly dynamic use of concepts such as *operational sequence* and *technical style* for explaining recurrent processes of hybridization in material culture.”

The chapters by Berg, Laneri, Roux, De La Fuente, Jeffra, Gheorghiu, and Deal explicitly use the *chaîne opératoire*, but the use of the concept is implied in several other papers, including Inácio *et al.* and Ramon Joffre. Berg, Laneri, Roux, and De La Fuente begin their contributions with substantive discussions about the concept. Panteleeva mentions the use of petrographic analysis, while three other contributions employ and report the results of basic petrographic studies (Inácio *et al.*, De La Fuente, and Thér and Gregor). The 14 contributions, many by young European scholars, demonstrate the state of ceramic studies oriented to archaeometry, operational sequencing, experimental archaeology, and ceramic ethnography. These are valuable contributions that characterize the status of ceramic investigations as of 2010 and colleagues in both the Old and New Worlds would benefit by reading them.

Harappan Potteries, D. P. Sharma (ed.), Delhi: Bharatiya Kala Prakashan, 2010. xx + 299 pp., 87 figures, 107 color plates, 14 tables, 11 endnotes, 2 appendices; ISBN 978-81-8090-261-1, Rs. 3500/\$145.00. Available from the publisher, www.bkpbooks.com, but can be found for prices as low as \$81.00 from other book dealers, some have prices of \$194.40 and \$175.00 including shipping. This volume was “Published by C. P. Gautam for Bharatiya Kala Prakashan, laser typesetting by Twinkle Graphics, printed by [left blank].” In the “Preface” the editor wrote: “Author is thankful to Mr. C.P. Gautam of Bharatiya Kala Prakashan for publishing this book with in short period” (p. viii); as we shall see, this thanks is misplaced. There are 20 chapters, a “Preface” (pp. vii-viii), an “Introduction” (pp. ix-xii), “List of Figures” (pp. xii-xv), and “List of Plates” (pp. xvii-xx). There is a “Bibliography” (pp. 288-289) with 78 entries, and an “Index” (pp. 290-299). The individual chapters have separate references (a total of 612 from all of the bibliographies plus one “suggested readings”).

“Chapter 1. Early Mature and Harappan Pottery” by D. P. Sharma, Sudha Satyawadi and Anisha Saxena (pp. 1-34, 30 figures, 157 references). The authors state that the earliest pottery in India dates to 6000 BC, painted pottery [meaning monochrome] dates 4000-3800 BC, and

polychrome ceramics date to 3500-3200 BC. There is a discussion of major sites and ceramic decoration and vessel shapes. There are 77 sites in the Early Harappan (3500-2700 BC) and five regional phases; the Kot-Diji phase in the Northern Sind is represented by 114 sites, the Damb Sadaat phase has 38 affiliated sites, and the Sothi Sistaal phase has 38 sites. Seven sites date to the Mature Harappan and regional variants are mentioned. The pottery from Mature Harappan was mostly wheel-made and four stages of surface treatment are reported. Fifteen Early Harappan motifs and symbols are documented (pp. 16-19). Citations to Kenoyer 1994 and Jenkins 1994 are not in the bibliography; other dates cited as 1086 and 1004 should be 1986 and 2004, respectively.

“Chapter 2. Harappan Pottery from Nausharo” by J. F. Jarrige (pp. 35-39, 12 figures, 8 references, 14 items in a bibliography, 1 endnote). Five research seasons on Early Harappan occupations are summarized, including two structures, four loci, and motifs and vessel forms. “Chapter 3. Early Harappan Pottery from Kalibangan” by Madhubala and J. P. Joshi. (pp. 40-42, 8 references). “Inferior clay” was used by the potters and the authors discuss six fabrics. An error, Valentine Roux (should be Valentine) occurs three times. “Chapter 4. Painted and Marks [*sic.*] Pottery Mehrgarh and Nausharo” by G. Quivron (pp. 43-58, 29 references, 6 endnotes). “Marks” should be “Marked.” The two sites are discussed and the 1,265 pot marks recorded at them include 38 unique signs and some proto-Elamite signs. The marks were mostly prefire engraved but some were painted. Quivron traces the distribution of the signs through time from 2900 to 2100 BC and notes that their purpose “remains unclear” but that they did not indicate “capacities, or registrations, or trademarks.” “Poleorient” should be “*Paléorient.*”

“Chapter 5. The Ravi Phase: Early Harappan Ceramics” by J. M. Kenoyer (pp. 59-66, 29 references, 1 table, 1 appendix). The early Harappan provisional chronology is 3300-2800 BC and Kenoyer considers ceramic changes during the Ravi Phase Periods 1A and 1B. In 1A, the craft tradition included hand-made beads, bangles, and figurines, while 1B had wheel-thrown bowls (red slipped with black designs) and nonlocal pottery. Period 2 is the Kot-Diji phase and includes kilns C14 dated to 2600 BC; an appendix lists seven radiocarbon dates and calibrations. A reference (p. 60, 66) to “S Shaffer (192 : 442)” should be to Jim Shaffer (1992:442); “Enrich” should be “R. W. Ehrich (ed.),” *Chronologies in Old World Archaeology*. “Chapter 6. Harappan Pottery Motif of Western India to Iran” by Ozra Rounaghi and V. S. Shinde (pp. 67-73, 8 figures, 25 references). The authors (an Iranian and an Indian), discuss the region from central and northeastern Iran through the northwestern and

western Indian Subcontinent for the Chalcolithic (4th-2nd millennium BC); two accompanying maps are illegible. They state that interaction between the regions may be due to trade or religion. Kulli pottery is noted in Iran, and at the site of Bampur, and on the Makran coast, and at the sites of Amri and Nal. Figurines and animal motifs on pottery are discussed. “Caspain” should be “Caspian.” “Chapter 7. Legacy of Harappan Motifs on Central Indian Pottery Chalcolithic (c. 2200-1200 B.C.) by Vijai Kumar (pp. 74-81, 14 figures, 32 references). The motifs were painted in black or light reddish black and occur in three categories: human figures, animal figures, and other symbols and designs. Humans include male and female forms of dancing figures and “general” human figures, while a variety of animal figures date to the Chalcolithic Malwa culture: bull (a popular fertility figure), dog, camel, donkey, and horse; wild animals include rabbit and antelope; aquatic forms include fish, crocodiles, and snails; insects and birds are usually scorpions and peacocks. There is “a wealth of stylized symbols and designs” (p. 78) including solar, star, and bow and arrowhead designs. “Meller” should be “Miller” (p. 81). “Chapter 8. Sothi Early Harappan Pottery” by K. N. Dikshit (pp. 82-84, 10 references, 1 endnote). Sothi (District Sri Ganganar, Rajasthan) was investigated by Sir Aurel Stein in 1942 but initially excavated by Ghosh in 1965 and new trenches were laid out in 1978 by the author, who describes the new excavation. The ceramics were dominated by Fabric types C and D from Kalibangan with some Fabric A also reported. Sothi Ware “may represent the “Early” and Harappan phase. The references are incomplete.

“Chapter 9. Harappan Painted Ceramics” by Sudha Satyawadi (pp. 85-101, 88 references). The author focuses on pottery motifs of two types: “those distributed over an entire canvas” and “those prominent in a routine design.” The latter include decorative, religious, ritualistic, personal, and ones related to superstition. Geometrical motifs were differentiated as floral, faunal, and symbolic, and Satyawadi discusses 10 selected ones: checker-board, horn, comb, bird, animal, fish scale, sun, planet, intersecting circles, and fish design. Motifs from other areas are mentioned. There are incomplete references and typos, Walter Fairservis is rendered as “Fair servis” with no further reference. “Chapter 10. Proto-historic Pottery from Shahr-i-Sokhta and Early Harappa” by D. P. Sharma, and Anisha Saxena (pp. 102-105, 2 figures, 2 unnumbered tables, 9 references). The site and four chronological periods spanning 3200-1800 BC were described and four regional phases of Early Harappan differentiated: Ravi, Amri-Nal, Kot-Diji, Samb Sadaat, and Sothi Siswal. They state “Largely three types of ceramic assemblage was found at Shahr-i Sokhta” [*sic*]

(p. 103). Trade and interregional contact were also discussed. "Chapter 11. Early Harappan Painted Gray Wares in Pakistan and Iran" by Rita Wright (pp. 106-115, 2 tables, 42 references, 2 endnotes). Wright's well-written and informative essay is a typological and distributional study of selected black-on-red and grey wares distributed in eastern Iran and Pakistan (Baluchistan). She discusses the contexts of the pottery, sampling and taxonomic frameworks, and differentiates two ceramic groups (Faiz Mohammad and Emir), classifying each (forms, surfaces, pastes, decorations, design motifs, forming techniques, etc.) geographical distribution, interregional contacts, burial and non-funerary contexts, and distinguishing stylistic traits from technological ones. Her chapter does not cite her own more recent publication on grey ware, suggesting that this essay may derive from an older manuscript; see R. P. Wright, (2006), "Third Millennium Painted Grey Wares in Pakistan and Iran," in D. P. Sharma and Madhuri Sharma (eds.), *Early Harappans and Indus Sarasvati Civilization*, New Delhi: Kaveri Books, pp. 453-465. "Chapter 12. Reserved Slip Ware in the Harappan Contest" [*sic.*] by D. K. Chakravorty (pp. 116-121, 2 tables, no references). Contest should, of course, be "Context." Reserved slip is a technique with limited spatial and chronological parameters whereby two coatings of color are applied to a vessel prior to firing and the upper one is "taken off" by a comb-like object leaving the color underneath exposed. Eighteen examples (Harappan and earlier Non-Harappan and West Asian) are also reported. The lack of any citations to the literature is unfortunate.

"Chapter 13. Petrographic Analysis of Early Harappan (c. 3500-2700 B.C.) Potteries of South Asia" by Graham Chandler (pp. 122-126, 3 tables, no references). This essay is nearly identical to the author's previous published discourses on the topic and focuses on the Bugti region of Baluchistan, Pakistan. Eight sherds were analyzed. The present chapter has in-note citations but no accompanying bibliography or references cited so that the earlier essays previous essays are more useful; see Chandler, Graham C. Chandler (2006), "Petrographic Analysis of Early Harappan Ceramics of South Asia (ca. 3500-2700 B.C.)," in D. P. Sharma and Madhuri Sharma (eds.), *Early Harappans and Indus Sarasvati Civilization*, New Delhi: Kaveri Books, pp. 144-150; and (1994) "Petrographic Analysis of Some Early Harappan Ceramics from the Bugti Region, Baluchistan," in A. Parpola and P. Koskikallio (eds.), *South Asian Archaeology, 1993: Proceedings of the Twelfth International Conference of the European Association of South Asian Archaeologists held in Helsinki University, 5-9 July 1993*, Vol. 1, Suomalainen Tiedekatemia,

Helsinki, pp. 147-155. Also relevant is his monograph: Graham Mansfield Chandler (2001) *Development of a Field Petrographic Analysis System and its Application to the Study of Socioeconomic Interaction Networks of the Early Harappan Northwest Indus Valley of Pakistan*. British Archaeological Reports, International Series S-995, Oxford: Archaeopress. He describes the creation of the portable petrography kit and devised a system that would produce and analyze thin sections under difficult working conditions on an archaeological site.

"Chapter 14. RD 89: A New Hakra Ware Site" by Kotty Dalal (pp. 127-131, 11 references). Dalal reports a site he located in 1967 near the Pakistan-Indian border southwest of Anupgarh that has mostly red ware ceramics. Six major wares were discerned with black painted red wares predominating; the range of wares and types are detailed and vessel forms related: Black Painted Red Slipped, Black Painted Red, Black Painted Buff Slipped Red, Black Slipped Red (four types), Dendritic Red, Plain and Black Painted Red (25 types), and Plain Red (six types). The site has since been destroyed. "Chapter 15. Ochre Coloured Ceramics" by R. C. Gaur (pp. 132-137, 50 references). Ochre Coloured Pottery (OCP) was first found and described by Lal in 1951 and dates 3200-300 BC. Gaur discusses the chronology and distribution of the pottery and infers that early Harappans and OCP people "were one and the same people who were none other than the Indo-Aryans" (p. 134). Eight lines of evidence are presented. "Chapter 16. Harappan Potteries from Dholavira" by A. Asthana (pp. 138-175, 4 tables, no references). The site is one of the earliest and largest urbanized Harappan cities on the western frontier of the Indian subcontinent, in this case, the Rann of Kutch in Gujarat. The author discusses the location, climate, geology, discovery, and excavations at the site and briefly characterizes Early Harappan ceramics, but there is a detailed account of Mature Harappan ceramics. Clays, fabrication techniques, slips, decoration, pot marks, appendages and miniature vessels are described as is Grey Ware and Black-and-Red Ware. The Kutch Harappans are characterized and Dholavira ceramics, sequences, contexts, catalogue, and correlation of ceramic and stratigraphical sequences are documented for seven stages within the Bronze Age (pp. 145-175). Information regarding fabrics, surface treatments, and firing is presented and this important essay helps to relate ceramics and chronology for the region. "Chapter 17. Mature Harappan Potteries" by A. K. Khanna (pp. 176-260, 1 appendix, 74 references). This lengthy chapter considers the functional aspects of Harappan pottery which has not received much attention in comparison to studies of decorative motifs. The background of the author's analyses and general characteristics of the

pottery are documented prior to a detailed presentation on 79 types classified on the basis of shapes. Vessel size ranges, variants, references to the published literature are provided for each type. There are also sections on the pottery types found at Chanhudaro; Mohenjo Daro and Harappa; types “found at a great number of sites”; shapes common at Harappa and Chanhudaro; types at Gumla; and other sites. The different types of wares besides Red or Black-on-Red Ware are also detailed. This is a significant contribution but, unfortunately, is typological/classificatory with no discussion of fabrics represented in the 79 types. “Atson” (p. 259) should be Matson.

“Chapter 18. Pottery Making -- Traditional Handicraft” by A. Asthana (pp. 261-269, 8 suggested readings). Basic information is presented on pottery-making tools and procedures (clay processing, forming, finishing and decoration, and firing). The references are incomplete and the essay rather pedestrian. “Chapter 19. Ethnography of Harappan Painted Motif” by Archana Choksi (pp. 270-285, 12 figures, 18 references). The author provides a useful essay on contemporary painted pottery vessels, relating the operational sequences, design rules, selections of slip and paint color, demarcation of the designs, apprenticeship and rules governing the painting process. The analysis is valuable for ethnoarchaeology and understanding the teaching of the craft. “Chapter 20. Glimpse of Early Pottery in East Asia” by A. K. Choudhary (pp. 286-267, no references). The author reports on early ceramics from the site of Yuchanyan in East China dating to 18,000-14,000 BP (calibrated) and compares the site to Mehrgarh (6000-500 BCC) and other sites.

“Programme: One day symposium “The Nature of Oriental Art” (follows p. 287) has no relation to the narratives in the current volume; the reason for its insertion this isn’t clear. A color “Map: Major excavated sites of the Indus Saraswati Civilization” has typographical errors: Afghanistan and Shurkotai (meaning Shortugai). The color plates commence with an image of a gold cup from Quetta depicting a lion. The remaining 106 illustrations from 25 sites appear to be reproduced in appropriate colors but none of the color plates have scales of measurement or greyscale and color bars. A site list follows (numbers of plates are in parentheses): Mehrgarh (33), Harappa (14), Nausharo (12), Bhirrana (6), Sothi (6), Mohenjodaro (4), Cholistan region (3), Dangi Meham (3), and Pirak (3). There are two each from Alagripur, Banawali, Kanmer, Nagwada, Nal, and Nindowari; and one each from Burzahom, Chanhudaro, Dadheri, Kot-Diji, Kunal, Kuntasi, Padri, Periano Ghundai, Ropar, and Surkotada.

Some of the contributions to this volume have the appearance of and read as if they were rough drafts rather than finished manuscripts. Typographical, grammatical, and factual errors abound and are complicated by stilted English and inconsistent style and formats. I began to wonder if the typesetting derived from original texts that were created via OCR (Optical Character Recognition) -- certainly there was no proofreading or quality control in the production of the book. There are missing italics in book and journal title citations (pp. 30-34, 84, 114-115, 136-137), incorrect or incomplete citations (p. 258-260, 288-289), missing year citations (p. 105, 269), missing page numbers in references, variable citation formats -- place of publication sometimes without publisher, authors’ surnames but no initials or first names (pp. 99-100). The surname of the well-known American scholar of Subcontinent archaeology, Gregory L. Possehl, is rendered in a variety of ways. Greg has been involved in excavations of in Indus Valley sites in India and Pakistan since 1964, and is an author of a half dozen books and numerous articles on the Indus Civilization and other topics. Likewise Heidi Miller is rendered in a variety of ways -- another embarrassment to the authors and editor. The “Index” (pp. 290-299) is useless: antelops (p. 290) not antelope. The following are alphabetized under the first initial of their first names or under titles rather than surnames: Asko Parpola (also under Parpola p. 296), B. B. Lal, Dr. Hamid’s (under D), F. R. Allchin (also under Allchin p. 290), Ernest Mackay (also under Mackay p. 295), Fredrik Barth, Graham M. Chandler H. J. Plenderleith, J. E. Jarrige, J. M. Kenoyer (also under Jonathan Mark Kenoyer and Mark Kenoyer), R. F. S. Starr, Sir Mortimer Wheeler, and Stuart Piggot.

In addition, a number of pages have light printing on (notably p. xii), the end papers are not glued properly, and the stitched binding is sewn with an inferior thread causing the volume to disbind. All in all, given the errors, omissions, mistakes, substandard printing and binding, and lack of quality control in content and publishing, this volume is not worth adding to a collection.

Science in Archaeology and Archaeo-Materials, Arun Kumar Biswas (ed.), New Delhi: D. K. Printworld (P) Ltd. 2005. vii + 374 pp., 95 black-and-white figures, 27 color plates, 31 tables, references, index. ISBN 81-246-0311-1, Rs. 1800/=, \$90.00 US (hardcover). Online bookseller prices vary from \$41.00 to \$90.00 depending upon delivery costs. Professor Arun Kumar Biswas, the author of nine books including *Minerals and Metals in Ancient India*, 2 vols. (1996), *Minerals and Metals in Pre-Modern India* (2001) and editor of *History, Science*

and Society in the Indian Context: A Collection of Papers, is a scholar with varied pursuits, ranging from the history of science and the history religions to sacred and secular literatures. He has edited the internationally acclaimed, multi-authored *Profiles in Indian Languages and Literatures*. Biswas holds a M.Sc. Tech and D. Phil from Calcutta University and an M.S. in Metallurgy from the Massachusetts Institute of Technology (USA) and has focused on archaeo-metallurgy, applied chemistry, surface chemistry, mineral engineering, and hydrometallurgy. He taught at the prestigious Indian Institute of Technology, Kanpur from 1963-1995 and is currently associated with the Asiatic Society, Calcutta, and is a member of the National Commission for History of Science, Indian National Science Academy, New Delhi. He writes that the idea for compiling this book came to him when he was analyzing the curricular aspects of archaeological teaching in Indian universities and saw a need for this compendium. In this volume, twenty-six authors collaborated to present fifteen articles that seek to provide a new focus on archaeology and underscore the importance of using scientific knowledge and methods in its pursuit. The volume is divided into two sections: "Science in Archaeological Studies" and "Science in Archaeo-material Studies." Each chapter has its own references and there are a total of 586 some of which emphasize Indian and European literature rather than American. Terms such as archaeo-materials, archaeo-metallurgy, and other "archaeo-" expressions are consistently hyphenated. I shall provide a general summary of the chapters, and elaborate the two dealing with ceramics.

There is a brief "Introduction" (pp. vii-viii) by Professor Biswas who points out that "many of the authors of this book including myself are material scientists and not archaeologists. Therefore we decided to compile a separate section on 'Science in Archaeo-material Studies' with great humility as learners ..." (p. vii). "Part I: Science in Archaeological Studies" has six chapters by eight authors: 1. "Science in Archaeology" by Arun Kumar Biswas (pp. 3-35) begins with an attempt to define archaeology and reviews the C. P. Snow concept of "two cultures" inherent in archaeology and strongly endorses the scientific aspect. He reviews information on human antiquity and Indian antiquity, concept of science and measurement, archaeo-materials, the analysis of minerals and metals, instrumental analysis, and statistics before critiquing the archaeological curricula in Indian institutions of higher learning. 2. "Prehistoric Sequence Datings: A Review" by O. K. Bhattacharyya (pp. 37-46, 2 figures, 21 references). The author discusses the topics of chronology, archaeology in anthropology, and cultural sequences. 3. "Radiocarbon Dating by Accelerator Mass Spectrometry in Archaeology" by D. P. Chowdhury (pp.

47-55, 1 figure, 21 references). This essay is a review of the history and concept of radiocarbon dating, β -counting, and AMS and its applications. 4. "Spatio-thematic Information: Role of Remote Sensing - An Aid to Archaeological Survey" by Parthasarathi Chakravarti and Sanjoy Nag (pp. 57-79, 4 figures, 10 color plates, 1 table, 29 references). The authors discuss remote sending and its applications to archaeological research, earth observing satellites (1972 ff.), image analysis and digital image processing, and GIS and sources of error. Examples from the Sarasvati River and West Bengal are reviewed. 5. "Microelectronics in Archaeological Remote Sensing" by Swapan Sen (pp. 81-91, 7 figures, 3 references). Multispectral imaging, electro-optical scanners, satellite remote sensing, and types and sources of dating are the focus of the chapter. 6. "Genetic Perspective of Origin and Evolution of Indian Population" by Susanta Roychoudhury and Sangita Roy (pp. 93-105, 6 figures, 2 tables, 21 references). The authors review principles of genetic variation, methods, heterozygosity, haptotype and haptogroup frequencies, nucleotide diversity, molecular analysis, genetic distance and phylogenetic analyses.

Part II, "Science in Archaeo-materials Studies" has nine chapters prepared by 19 authors. 7. "Remains, Residues and Slags in Indian Archaeology" by Arun Kumar Biswas (pp. 109-134, 4 figures, 7 tables, 50 references). The main topics include plant, animal, and human remains; ash mounds, metallurgical tailings and slags; lead-zinc ore residues and slags in ancient India (Udaipur mines and the Zāwar mines and furnaces); the thermodynamics of smelting; and retorts and residue analysis.

Two chapters in Part II and a brief comment (pp. 320-32) in Chapter 14 concern pottery which concerns the analysis of pottery. 8. "Beyond Waves and Shapes: Gaining A Petrographic Perspective" by K. Krishnan and Kajal Shah (pp. 135-156, 2 figures, 8 color plates, 97 references). Typological classification and scientific analyses are reviewed but the chapter focuses on ceramic petrology (pp. 137-146) in terms of thin-sections, methodologies, textual analysis (point counting), applications, and limitations. The same paste recipe was used to create different vessels forms which had different surface treatments and firings and exhibited different physical properties. There is no citation for the source of Figure 8.2, "Fabric Characterization," but it appears to come from one of Sander van der Leeuw's publications; all of the color plates are photomicrographs of thin sections. Examples of ceramic wares from India are discussed and include Rouletted, Black and Red, Micaceous, and Northern Black Polished (NBPW). Black Slipped Ware (BSW) has been regarded as a precursor of NBPW while NBPW has been characterized by some

researchers as simply Painted Grey Ware (PGW) with an addition of a black polished slip -- but the authors' analysis now calls these assumptions into question. Half of the bibliographic references are from the European and American literature and include many familiar names: Shepard, Dales and Kenoyer, Starr, Hodder, Shennan, Rice, Miller, van der Leeuw, McGovern, Hedge, Neff, Barnett, Blackman, Bishop, Whitbread, Freestone, Peacock, Middleton, Wheeler, and Sillar and Tite. 9. "Pottery Technology and Provenance Studies from the Site of Chandraketurgarh in Lower Bengal" by Anjan Das, Sheena Panja, Tapas Kumar Mukhopadhyay, and Sachchidandanda Chakrabarti (pp. 157-180, 9 figures, 6 color graphs, 3 tables, 28 references). The essay focuses on ceramic archaeochemistry and specimens from a pottery production site located northeast of the city of Kolkata where Rouletted Ware and Black Slipped Ware were recovered. A sample of 20 specimens (clays and sherds) from each ware was studied using a variety of methods; sample selection and preparation of clays into briquettes for firing and sherds were also reviewed. The methods were: Petrography, optical mineralogy, DTA, XRD, SEM, XRF, AAS, NAA, PIXE, EDAX, and Mössbauer spectroscopy. The results of chemical analyses, fired properties, thermo gravimetry, slip analysis, clay characterizations, and comparisons of clays and ancient pottery are reported. The analyses of firing temperatures suggested that the wares were not fired above 500° C yet remained well-preserved after three millennia. The selection of a fine clay which was mixed with other fluxing materials is noted, but the nature of the additives isn't further elaborated. The bibliographic citations refer to seminal work by Dean Arnold, Kingery, Reed, Rutter and Tite.

10. "Metallurgy for Archaeology" by P. Ramachandra Rao and K. K. Mandal (pp. 181-206, 17 figures, 3 tables, 18 references). The extraction of eight metals from their ores are documented (Au, Ag, Cu, Fe, Pb, Zn, Mg, and Ni), and information on refining (furnaces, crucibles, slags, etc.) are presented. The authors review the structure of metals and alloys, crystal structure, mechanical properties, phase diagrams, the production of metal artifacts, and microscopy, and SEM and TEM. They also differentiated cold-working from casting on the basis of microstructures. 11. "Copper and Copper Alloys in Archaeological Perspective" by Prasanta Datta (pp. 207-270, 59 figures, 3 color plates, 5 tables, 43 references). Physical characteristics, conductivity, bonding, ductility, colors, corrosion, alloying, molding, and extraction in ancient India are documented, and the author also reviews thermal, electrical, and mechanical properties. 12. "Emission Spectrography as a Scientific Tool" by M. L. Dutta (pp. 271-273, 11 references). The procedures for estimating the amount of carbon in steels

and cast irons are presented. 13. "Characterization of Rust on Ancient Indian Iron" by R. Balasubramaniam, A. V. Ramesh Kumar and P. Dillmann (pp. 275-314, 21 figures, 5 tables, 80 references). The characteristics of rust; microstructural analysis (SEM); compositional analysis (EPMA); and analyses using Raman, Infrared, and Mössbauer spectroscopies and XRD are reviewed. 14. "Basic Principles and Modern Techniques in the Studies of Archaeo-Materials in Eastern India" Pranab Chattopadhyay (pp. 315-34, 5 figures, 2 tables). The author discusses specimen selection and preparation, chemical analyse (XRF and XRD), metallographic analysis (SEMP), and the analyses id slag. Analyses of various artifacts are also summarized: pottery (pp. 320-322), iron, and silver. Lastly, 15. "Non-destructive Evolution for Characterization of Archaeometallurgy Objects" by Baldev Raj, B. V. R. Tata, T. Jayakumar, and U. Kamachi Mudali (pp. 335-368, 17 figures, 3 tables, 14 references). The contributors provide reviews of the following: visual inspection, specific gravity, acoustic properties, radiographic analysis, thermography, stress measurements, laser holography, interferometry, and Raman microscopy as well as XRF, SES, and TEM. The laser cleaning of artifacts is also considered. A "List of Contributors" (pp. 369-372) and a topical "Index" (pp. 373-374) complete the volume.

In general this is a significant (albeit now slightly dated) contribution to the literature on the uses of scientific techniques in archaeological research. It is not meant to be a comprehensive compendium. For example, there are some methodologies that are not reviewed, normal gas C14 dating in Chapter 3 and TL dating, for example. Readers would likely want to have more recent treatments of RS and GIS. The ceramic studies focus on petrography (Chapter 8) but are rather brief on other analytical methods (Chapter 9). However, there are useful general treatments with relevant examples from Indian archaeology employed as examples/case studies. NAA does not receive a full treatment anywhere in the volume. Nonetheless, remembering that this is an introductory compendium for graduate students it provides a basic framework for an archaeological curriculum for Indian colleges, universities, and research centers. Hence, it is much different than other volumes on archaeological chemistry. The references dating most recently to 2004 are full citations with page numbers dates of publication, and publishers indicated. The text is well-printed and the color places a valuable addition to the volume. Alas, the binding is weak and improperly glued and separated from the backboard.

Shipwrecked: Tang Treasures and Monsoon Winds, Regina Krahl, John Guy, J. Keith Wilson, and Julian Raby (eds.), with contributions by Alison Effeny,

Michael Flecker, John Guy, Jessica Hallett, Hsieh Ming-liang, Regina Krahl, Li Baoping with Chen Yuh-shiow and Nigel Wood, Liu Yang, François Louis, Qi Dongfang, Wang Gungwu, Tom Vosmer, and J. Keith Wilson; Arthur M. Sackler Gallery, Smithsonian Institution, Washington, DC; the National Heritage Board, Singapore; and the Singapore Tourism Board, 2010. Cloth edition distributed by Smithsonian Books through Random House, xix +307 pp. 484 illustrations (181 color and 303 black-and-white), a glossary, endnotes, and bibliography; ISBN-10: 1588343057, ISBN-13: 978-1588343055, \$65.00 (cloth) – less costly copies are available from several online bookstores. This is the companion catalogue to an internationally traveling exhibition of the same name, “Shipwrecked: Tang Treasures and Monsoon Winds,” that documents an important archaeological revelation recovered in the 20th century. The exhibition opened in February 2011 at the ArtScience Museum in Singapore and is scheduled to travel to the Arthur M. Sackler Gallery of the Smithsonian’s Museums of Asian Art in 2012. The volume’s editors are Regina Krahl (an independent researcher and an expert in the Chinese production of high-quality ceramics and their export markets), John Guy (Curator of South and Southeast Asian Art at the Metropolitan Museum of Art, who has extensively researched all early shipwrecks discovered in insular Southeast Asia), J. Keith Wilson (associate director and curator of Chinese art, Freer Gallery of Art and Arthur M. Sackler Gallery, Smithsonian Institution), and Julian Raby (director of the Arthur M. Sackler Gallery).

Some archaeologists are criticizing the ethics of this exhibition, which contains Tang dynasty artifacts salvaged in the late 1990s by a private company (Seabed Explorations GbR) from an Arab dhow that sank in the Java Sea in the 9th century CE. Critics contend that the company did not observe professional archaeological standards during the recovery of the artifacts and object to the later sale of the objects to another company for an estimated \$32 million, which contravenes archaeological ethics. However, the artifacts were recovered within the established laws of Indonesia and no laws were broken during the salvage operation. Several American archaeological organizations and three units within the Smithsonian Institution have strenuously objected to the exhibition. The excavations were undertaken by a trained archaeologist, Michael Flecker (Maritime Explorations, Singapore), who has published the results of the recovery in the *International Journal of Nautical Archaeology* (2000 and 2008) and *World Archaeology* (2001). Your reviewer takes no position on this ethical issue but will simply provide a review of the content of the exhibition catalog, including the context of the recovery and artifacts, with emphasis on the ceramics.

Twelve centuries ago, a merchant ship, an Arab dhow, foundered on a reef off the coast of Belitung, a small island in the Java Sea. On board were lead ingots, bronze mirrors, spice-filled jars, intricately worked vessels of silver and gold, and more than 60,000 glazed bowls, ewers, and other ceramics. The ship remained buried at sea for more than a millennium, its contents protected from erosion by their packing and the conditions of a silty sea floor. It wasn’t until 1998 that fishermen discovered the wreck, lying in shallow waters less than three kilometers offshore. The Belitung wreck is the oldest Arab vessel discovered in Asian waters, but also contained the largest group of Tang dynasty artifacts ever found. The archaeological recovery of both the ship and cargo has allowed for a radical reappraisal of the Maritime Silk Route to China.

The catalog begins with four forewords, acknowledgments, and list of sponsors (pp. ix-xvii) followed by an “Introduction: Ships in the Nanhai” (pp. xviii-xix) by Wang Gungwu (chairman of the East Asian Institute and university professor, National University of Singapore). “The Maritime Silk Route in the Ninth Century” (pp. 2-17, 10 figures) considers empires (Abbasid and Tang c. 820 CE), desert and maritime routes, and empires of Southeast Asia. John Guy wrote “Rare and Strange Goods: International Trade in Ninth-Century Asia” (pp. 19-34, 11 figures, 49 endnotes), followed by “Discovery and Recovery” (pp. 30-34, 3 figures, 5 endnotes). “Dating the Belitung Shipwreck” (pp. 35-44, 9 figures) by J. Keith Wilson and Michael Flecker provided numismatic evidence and considers the crew and their possessions. Regina Krahl’s essay “Chinese Ceramics in the Late Tang Dynasty” (pp. 45-74, 24 illustrations, 20 endnotes) reviews Changsha Wares, Green-splashed Wares, Celadon, and White Wares,” while Jessica Hallett wrote about “Pearl Cups Like the Moon: The Abbasid Reception of Chinese Ceramics” (pp. 75-81, 7 figures, 29 endnotes), and there is an essay by François Louis, “Metal Objects on the Belitung Shipwreck” (pp. 85-92, 5 figures, 29 endnotes). Michael Flecker wrote “A Ninth-Century Arab Shipwreck in Indonesia: The First Archaeological Evidence of Direct Trade with China” (pp. 101-119, 16 figures, 62 endnotes) and Tom Vosmer penned “The Jewel of Muscat: Reconstructing a Ninth-Century Sewn-Plank Boat” (pp. 121-135, 9 figures, 4 endnotes).

The seven subsequent essays deal with ceramics: “The Navigational Route of the Belitung Shipwreck and the Late Tang Ceramic Trade” (pp. 137-143, 3 figures, 44 endnotes) is by Hsieh Ming-liang, while Liu Yang wrote “Tang Dynasty Changsha Ceramics” (pp. 145-159, 7 figures, 32 endnotes), and Hsieh Ming-liang added “White Ware with Green Décor” (pp. 161-175, 15

illustrations, 65 endnotes). Li Baoping, Chen Yuh-shiow, and Nigel Wood collaborated on “Chemical Fingerprinting: Tracing the Origins of Green-Splashed Ware” (pp. 177-183, 5 illustrations, 13 endnotes). Regina Krahl also contributed three essays: “Green Wares of Southern China” (pp. 185-199, 21 illustrations, 38 footnotes), “White Wares of Northern China” (pp. 201-207, 11 illustrations, 28 endnotes), and “Tang Blue-and-White” (pp. 209-211, 5 figures, 10 endnotes). François Louis wrote on “Bronze Mirrors” (pp. 213-219, 5 illustrations, 21 endnotes) while Qi Dongfang authored “Gold and Silver Wares on the Belitung Shipwreck” (pp. 221-227, 14 figures, 26 endnotes). The exhibition checklist contains 303 black-and-white illustrations with measurements given in cm (pp. 229-265), and there is a useful 41-item glossary (pp. 267-268), 486 endnotes (pp. 269-281), and bibliography with 387 entries (pp. 283-296), plus a list of 14 contributor and staff (p. 296) and credits (pp. 297-299). There is a double-columned index of proper nouns and topics (pp. 301-307). Seventeen Sackler Gallery staff assisted in preparing the catalog which was printed in Singapore. The maps and illustrations are excellent and the essays are by international experts. The narratives document both the ship and the men who sailed it, and of the cargo, its production and markets. The publisher’s blurb states that “the vast capacity and technical sophistication of China’s kilns are reflected in the number and variety of the ceramic goods, which simultaneously cast light on contemporary West Asian taste. Meanwhile, the glamour of the silver and gold objects speaks of diplomatic ties and tribute, although their ultimate destination remains a mystery.” The editors and authors have combined art history, history, and marine archaeology to create a compelling narrative about Chinese ceramic production during the Tang dynasty and demonstrate that China was a significant part of the political and economic world.

Adventures in Pre-Columbian Studies: Essays in Honor of Elizabeth P. Benson, Julie Jones (ed.), Washington, DC: Pre-Columbian Society of Washington, DC, 2010, 209 pp., 109 figures, ISBN 0-978-0-615-36009-6. The price of the book is \$30 (which includes postage within the U.S.), non-U.S. orders are \$50 (including postage); checks drawn on U.S. banks should be made out to the Pre-Columbian Society of Washington, D.C., and mail them to PCSWDC (11104 Bucknell Drive, Silver Spring, Maryland 20902-4432, USA) further information is available at jcs@ancientamerica.net. This handsome, well-illustrated, scholarly volume is the publication in the Proceedings of the Pre-Columbian Society of Washington, DC on the symposium “Adventures in Pre-Columbian Studies: Illuminating the Past and Imagining the Future” held on September 16, 2006. The symposium honored Dr. Elizabeth (“Betty”) Benson, a distinguished

American art historian, curator, and scholar, known for her many contributions to the study of Pre-Columbian art, in particular that of Mesoamerica and the Andes. She was a former Andrew S. Keck Distinguished Visiting Professor of Art History at the American University, Washington, DC, and had a long affiliation with Harvard University’s Dumbarton Oaks Research Library and Collection, where she served as Director of Precolumbian Studies and as curator of the collection of Pre-Columbian art works. Betty is an expert on the Moche culture and ceramics of ancient Peru, and Maya iconography.

The work begins with an “Acknowledgment” by Patricia Anawalt (pp. 11-13, 1 figure, 4 works cited) followed by a “Foreword” by Lucy B. Wilson (pp. 15-16) and a “Preface” by Pre-Columbian Society of Washington, DC (pp. 17-21). Ceramics are featured in several subsequent chapters. “From the National Gallery of Art to *Ritual Sacrifice in Ancient Peru*” by Julie Jones (pp. 23-48, 13 figures, 62 works cited). There are rollouts illustrating a Moche ceramic stirrup spout bottle and a Maya cylindrical ceramic vessel. “Riding the Cayman Canoe: The Iconography of Bats in Chavín Art” by Peter G. Roe and Amy W. Roe (pp. 51-75, 20 figures, 58 works cited, 17 endnotes) is an important contribution to understanding ritual and iconography in Peru’s Chavín culture, while “The Rise of Social Complexity and the Evolution of Rulership in Moche Society and Visual Culture” by Steve Bourget (pp. 77-96, 29 figures [16 depict ceramics], 33 works cited) emphasizes ceramics. Justin Kerr’s chapter “The Maya Cylinder: A Short History Unrolled” (pp. 99-118, 26 figures [23 illustrate ceramics], 28 works cited) is devoted to cylindrical Maya vase iconography and decoration. Other chapters are “Sacrifice as Reciprocity: Mesoamerican and Andean” by Esther Pasztor (pp. 121-136, 10 figures, 22 works cited) and “The Sacred Deer Complex: Out of Eurasia” by Alana Cordy-Collins and five students (pp. 139-158, 12 figures [4 are ceramics], 46 works cited, 6 endnotes). “Dear Betty: Letters from Gillett” by Elizabeth P. Benson (pp. 161-167, 6 figures, 6 works cited). The contribution features illustrated letters to Betty Benson from her colleague Gillett G. Griffin (Curator Emeritus, Precolumbian Collection, Princeton University Museum). In “The Future: For Every Answer, Ten Questions” by Elizabeth P. Benson (pp. 169-180, 1 figure, 23 works cited), the honoree discusses her methods and philosophy of analysis and the *festschrift* concludes with the “Bibliography of Elizabeth P. Benson” (pp. 181-208) which covers the period 1963 through 2010 and contains 144 entries. Betty was the author of 106 publications, edited an additional 22 volumes, and organized 16 symposia or other meetings. This volume is a fitting tribute to an esteemed senior scholar and the Pre-

Columbian Society of Washington, DC is to be congratulated on their effort to produce such a splendid, beautifully illustrated compendium.

Late Antique/ Early Byzantine Glass in the Eastern Mediterranean, Ergun Lafti (ed.), *Colloquia Anatolica et Aegaea – Acta congressus communis omnium gentium Smyrnae II/Dokuz Eylul University, Faculty of Arts, Department of Archaeology, Division for Medieval Archaeology. Publication Series No. 1.* Izmir: Hurriyet Matbaasi, 2009. xx + 403 pages, numerous black-white figures; ISBN 978-605-61525-0-4, 80 gr. This book on the archaeology of glass has recently become available both in print and electronic pdf forms; the editor is responsible for its distribution. Each paper is available separately in pdf format from Ergun Lafti terracottas@DEU.EDU.TR. This is the first edition with a printing of 500 copies and contains 34 papers from the International Colloquium, “Late Antique Glass in Anatolia (4th to 8th centuries A.D.)”, October 25-28, 2009, held in Izmir, Turkey. Thirty-two papers are in English and two in German; the paper abstracts and key words are in English, German, Turkish, and Italian. The contents are as follows:

Atik, S., “Late Roman/Early Byzantine Glass Finds from the Marmaray Rescue Excavation at Yenikapi in Istanbul” (pp.1-16); Canav Ozgumus, U., “Late Roman/Early Byzantine Glass from the Marmaray Rescue Excavations at Sirkeci” (pp. 17-24); Kanyak, S., “Late Roman/Early Byzantine Window Glass from the Marmaray Rescue Excavations at Sirkeci” (pp. 25-47); Cakmakci, Z., “A Typological Approach to Glass Goblet Production from Late Antiquity to the Middle Ages in the Light of Recent Finds” (pp. 49-66); Schwarzer, H., “Spaetantike und byzantinische Glasfunde aus Alexandria Troas” (pp. 67-84); Schwarzer, H., “Spaetantike, byzantinische und islamische Glasfunde aus Pergamon” (pp. 85-109); Yaras, A., “Late Antique Glass from Alliano (Aiolis)” (pp. 111-112); Yaras, A. and Yaras, C., “Glass Bracelets from Gure-Ilica (Mysia)” (p. 113); Schaetzschok, M., “Glass from Terrace House 2 at Ephesus” (pp. 115-122); Contardi, S., “Late Antique Glass from Iasos (Caria)” (pp. 123-132); Blid, J., “Late Antique Glass in Sacred Context: A hagiaσμα at Carian Labraunda” (pp. 133-150); Celik, I. U., “Glass from the 2006 Excavation Season in the Theatre at Nicaea” (pp. 151-160); Lafli, E., “Glass from Hadrianoupolis (Paphlagonia)” (pp. 161-170); Lachin, M. T., “Vitreous Mosaic from Tyana (Cappadocia) (with an appendix by Chiara Letizia Serra, Alberta Silvestri and Gianmario Molin):” (pp. 71-183); Doksanalti, E. and Saglam, S., “Late Roman Glass from the Museum of Karaman” (pp. 185-186); Tekocak, M., “Late Roman Glass from the

Museum of Aksehir” (p. 187); Baybo, S., “Late Antique/Early Byzantine Glass Vessels from Trench Q18 at Limyra: Excavation Seasons 2007-2009” (pp. 189-198); and Bakirer, O., “Glass from the Seljuk Palace at Alanya” (pp. 199-212).

Beser E., Uzun, A., Akyol, A. A., Demirci, S., and Kadioglu, Y. K. “Archaeometry of the Glass from Alanya” (pp. 213-233); Koroglu, G., “Glass from Yumuktepe (Cilicia)” (pp. 235-243); Gunes, F., “Late Antique Glass from the Museum of Kahramanmaraş” (pp. 245-252); Antonaras, A., “Glass Vessels of Early Christian Thessaloniki (3rd-6th cent. A.D.)” (p. 257); Nikita, K., “Late Roman/Early Byzantine Window Glass from Sector I in Eleutherna (Crete)” (p. 259); Cholakova, A., “Glass from Late Antique/Early Byzantine Dichin (Northern Bulgaria)” (pp. 261-262); Rehren, Th. and Cholakova, A., “Early Byzantine HIMT Glass from Bulgaria” (p. 263); Krizanac, M., “Glass from Early Byzantine Gradina on Mount Jelica (Serbia)” (pp. 265-284); Milavec, T., “5th-6th Century Glass from the Hilltop Settlement of Tonovcov Grad (Slovenia)” (pp. 285-300); Golofast, L., “Early Byzantine Glass from the Tauric Chersonesos (Crimea)” (pp. 301-335); Khruskova, L., “Late Antique Glass from the Eastern Black Sea: Christian Context” (pp. 337-353); Baghaturia-Kner, E., “Late Antique/Early Byzantine Glass Vessels from the Cemeteries of Kodori and Machara Valleys (Georgia)” (pp. 355-368); Shalikadze, T. and Kakhidze, E., “Early Byzantine Glass Vessels from the Southwestern Littoral of Georgia” (pp. 369-377); Shavlakadze, Q. and Sakhvadze, A., “Early Medieval Glass Production in the Central Transcaucasus” (p. 379); Jennings, S., “Glass Vessels in Beirut Before and After A.D. 551” (p. 381); Funfschilling, S., “Glass from the Canadian Excavations at Carthage” (pp. 383-390); and Lafli, E., “Part 4: A Bibliographical List of the Late Antique/Early Byzantine Glass Studies in Anatolia Until the Year 2009” (pp. 391-403).

Online Resources

George L. Miller and the Council for Northeast Historical Archaeology (CNEHA). George L. Miller (now retired from URS Corporation) is a well-known American historical archaeologist who has published numerous significant, well-documented articles and commentaries of historical ceramics. The *Council for Northeast Historical Archaeology Newsletter* is distributed to all members on a quarterly basis. Back issues are posted on their Web site as pdfs after they have been distributed to the membership. Selected articles from earlier *Newsletters* will be added as they become available: <http://www.cneha.org/publications.html>. The

first selection is a set of four of George Miller's essays which can be downloaded for free. The original citations for these are: *Council for Northeast Historical Archaeology Newsletter = CNEHA Newsletter*: "Thoughts Towards a User's Guide to Ceramic Assemblages, Part I: Lumping Sites into Mega-assemblages by Those That Cannot Tell Time" *CNEHA Newsletter* 18:2-5 (April 1991); "Thoughts Towards a User's Guide to Ceramic Assemblages, Part II: What Does This Assemblage Represent?" *CNEHA Newsletter* 20:4-6 (November 1991); "Thoughts Towards a User's Guide to Ceramic Assemblages, Part III: Breaking Archaeological Assemblages into Functional Groups" *CNEHA Newsletter* 22:2-4 (July 1992); and "Thoughts Towards a User's Guide to Ceramic Assemblages, Part IV: Some Thoughts on Classification of White Earthenwares" *CNEHA Newsletter* 26:4-7 (November 1993). The direct URL is: <http://www.cneha.org/newsletters/millerguide.pdf>. Parts I-III had also been reprinted in *Victorian Ceramics Newsletter* 1(2), (September 1995); 1(3), (December 1995); and 1(4), (May 1996). Miller's classic article, "A Revised Set of CC Index Values for Classification and Economic Scaling of English Ceramics from 1787 to 1880" published originally in *Historical Archaeology* 25(1):1-25 (1991) has now been translated into Portuguese and published as "Valores Indexados Revisados Para Loucas CC, Fisando Classificação Econômica De Cerâmicas Inglesas de 1787 a 1880" in *Vestígios Revista Latino-Americana de Arqueologia Histórica* 3(1):103-140 (June 2009). The article is also available in a reader compiled by David R. Brauner, *Approaches to Material Culture Research for Historical Archaeologists*, 2nd ed. (Society for Historical Archaeology, 2000) ISBN13: 9781886818057, ISBN10: 1886818053, pp. 86-110.

The Texas A&M University Nautical Archaeology Program provides direct links to pdfs of theses and dissertations through the Texas A&M Electronic Thesis and Dissertation Digital Archive or Institute of Nautical Archaeology is required for the publication of any material; for a listing, see <http://nautarch.tamu.edu/academic/alum.htm>. This site is maintained by the staff of the Nautical Archaeology Program: cmacwebmasterf@tamu.edu. The contents of this site (text, images, and data) are intended for personal information only. Downloading for private use of the information or graphic images is not discouraged. However, written permission from either the Nautical Archaeology Program or the Institute of Nautical Archaeology is required for the publication of any material. Theses finished prior to 2003 are available for download directly from this website. All theses and

dissertations finished after 2002 are available from the [Electronic Thesis and Dissertation Digital Archive](#). All dissertations finished before 2002 may be downloaded for free by Texas A&M faculty, staff, and students from [ProQuest Digital Dissertations](#) database. All Anthropology Department theses and dissertations can also be downloaded from their Web site at <http://anthropology.tamu.edu/theses/index.php>. Among the Nautical Archaeology Program's listings are a number of theses and dissertations that concern ceramic materials (a sample follows); other listings also have ceramic content and the reader is encouraged to examine the tables of contents of the other entries.

Dewolf, Helen C, Ph.D. 1998, *Chinese Porcelain and Seventeenth-Century Port Royal, Jamaica*; Donachie, Madeleine, Ph.D. 2001, *Household Ceramics at Port Royal, Jamaica, 1655-1692: The Building 4/5 Assemblage*; Fox, Georgia L., Ph.D. 1998. *The Study and Analysis of the Kaolin Clay Tobacco Pipe Collection from the Seventeenth-Century Archaeological Site of Port Royal, Jamaica*; Garver, Elizabeth, M.A. 1993, *Byzantine Amphoras of the Ninth through Thirteenth Centuries in the Bodrum Museum of Underwater Archaeology*; Haddan, Lester J., M.A. 1995, *Ceramics from the American Steamboat Phoenix (1815-1819) and their Role in Understanding Shipboard Life*; Hailey, Timothy I., Ph.D. 1994, *The Analysis of 17th-, 18th-, and 19th-Century Ceramics from Port Royal, Jamaica for Lead Release: A Study in Archaeotoxicology*; Heidtke, Kenan P., M.A. 1992, *Jamaican Red Clay Tobacco Pipes*; Hirschfeld, Nicolle, M.A. 1990, *Incised Marks on Late Helladic and Late Minoan III Pottery*; Ingram, Rebecca S., M.A. 2005, *Faience and Glass Beads from the Late Bronze Age Shipwreck at Uluburun*; Lyon, Jerry, M. A. 1993, *The Pottery from a Fifth Century B.C. Shipwreck at Ma'agan Michael, Israel*; and Woodward, Robyn, M.A. 1988, *The Charles Cotter Collection: A Study of the Ceramic and Faunal Remains*.

Geoffrey M. Shipton, *SAOC 17: Notes on the Megiddo Pottery of Strata VI-XX* by Studies in Ancient Oriental Civilization 17. Chicago: University of Chicago Press, originally published in 1939. xiv + 49 pp., 1 figure, 20 plates, 1 chart. A preliminary report on the pottery of Megiddo Strata VI-XX presenting a nearly unbroken sequence of cultures from the earliest occupation on bedrock up to and including the last pre-Israelite period (ca. before 3000 to about 1100 B.C.). Internet publication of this volume and other books was made possible through the support of Misty and Lewis Gruber. The download URL is: <http://oi.uchicago.edu/research/pubs/catalog/saoc/saoc17.html>.

The Society for Clay Pipe Research, devoted to clay tobacco pipes, was founded in 1983 and is based in England but with a worldwide membership. Dr. Susie D. White, *SCPR Newsletter* Editor (email SCPR@talktalk.net), has announced a new Web site for the Society at <http://scpr.co/>. The site includes an informative Home page and tabs for Conferences (2008-2010 are featured plus information on the September 2011 meeting); Resources (two posted thus far); How to Join (membership information); Links; and Contact Information. There are three categories of Links: Other Clay Pipe Organizations (10 – Dutch, German and UK), Contemporary Pipe Makers (3 UK and 1 Australian), and Other Organizations that publish on clay pipes (4).

Boletín del Laboratorio de Petrología y Conservación Cerámica. On 1 February 2011, Dr. Guillermo A. De La Fuente, General Editor, *Boletín del Laboratorio de Petrología y Conservación Cerámica*, Escuela de Arqueología – UNCa / CONICET, San Fernando del Valle de Catamarca, Argentina, posted the following request for papers. The Laboratory of Petrology and Ceramic Conservation (LP&CC), Escuela de Arqueología, Universidad Nacional de Catamarca, calls for short research papers to be considered for the next *LP&CC Bulletin* (Vol. 3, N^a 1, Year 3). The *Bulletin* is the bi-annual academic and scientific publication of the Laboratory publishes short research contributions in ceramic studies in general, but preferentially in ceramic petrology, including research papers dealing with ceramic conservation studies. Ceramic studies in archaeology scope a broad range of research topics, thus papers to be submitted are not restricted to any theoretical and methodological approach. Papers must have a maximum of 15 A4 pages, simple-spaced, letter Tw Cen MT 10,5, a maximum of 6 figures (included photographs and graphics), and 2 tables. Papers will be peer-reviewed by 2 academic referees. Currently, the LP&CC Bulletin is published in full colour as .pdf format, and in W&B printed version. The last deadline to receive the papers was 30 March 2011. Email contact: labceramicaunca@gmail.com; telephone and Fax: 54-3833-425978.

Previous Meetings

The Society for American Archaeology 76th Annual Meeting. The SAA's 2011 annual meeting was held in Sacramento, California from 30 March to 3 April 2011. Approximately 3,300 presentations were given in 269 sessions -- symposia, forums, or poster presentations -- which included 113 contributions on ceramic materials -- pottery, figurines, residue analysis, etc.; there were four

poster sessions, four symposia, and three general sessions with ceramic content. The 113 had the following Geographical distributions: North American (north of Mexico), n = 40 (including 18 Southwest, 9 Northeast, and 6 Midwest); Mesoamerica, n = 36 (including 6 Basin of Mexico and 22 Maya area); Caribbean and South America, n = 15; "Americas," n = 1; Europe, n = 1; Asia, n = 11 (including 5 Southwest Asia, 4 Southeast Asia, and one each Central and South Asia); Polynesia, n = 1; and Africa, n = 3 (one each Egypt, East, and South Africa). Data for my summary has been drawn from the online abstracts. A list of the 11 ceramic sessions and the abstracts of symposia follow; the numbers in brackets refer to the session number. Readers who have access to the SAA website can download any session or individual abstracts at

<http://www.saa.org/AbouttheSociety/AnnualMeeting/2011/abstracts/tabid/1440/Default.aspx>. The 11 sessions were: [5] Poster Session: *Global Perspectives on Ceramic Analysis*. [19] Symposium: *Chemical Residue Analysis in Archaeology: Method, Development, and Residue Diagenesis* (sponsored by the Society for Archaeological Sciences). "Despite recent successes in the chemical analysis of residues recovered from archaeological artifacts, several problems continue to prevent studies of this type from achieving their full potential. This session addresses some of these issues by focusing on analyses conducted on archaeological and experimental samples with emphasis on residue diagenesis, soil-artifact interactions, method development, quality control and explicit discussion of assumptions and limitations. Attention to methods and diagenetic processes, rather than dramatic results, will help archaeological residue analysis mature as a field." [62] Poster session: *Advances and Applications of XRF and LA-ICP-MS*, Part 1. [63] Poster session: *Advances and Applications of XRF and LA-ICP-MS*, Part 2. [85] Symposium: *Ancient Maya Ceramic Production, Distribution, and Consumption*. "Investigation of pottery has long been considered one of the most productive methods of obtaining information about social, economic, and political organization in ancient societies. While traditional methods of ceramic analysis, such as the Type-Variety system of classification, continue to play an integral role in ceramic analysis, advances in investigative technology and the addition of new analytical methodologies have widened the range of potential information we are able to derive from Maya pottery. The intention of this symposium is to illuminate the use of new methods and technologies in the analysis and understanding of Maya ceramic production, distribution, and consumption." [142] General Session: *Advances in and Applications of XRF and LA-ICP-MSX*. [187] General Session: *Ceramic Analysis in the United*

States. [207] Poster session: *Ceramic Analysis in the United States*. [243] General session: *Ceramic Analysis in Mesoamerica*. [200] Symposium: *Archaeological Approaches to Indigenous Post-Conquest Developments in New Spain and Central America: Papers in Memory of Thomas H. Charlton*. “Inspired by Thomas H. Charlton’s major contributions to the field of historical archaeology, the papers in this session advance our understanding of indigenous Postconquest developments in New Spain and Central America. Contributors explore the central themes of Thomas Charlton’s work, including questions about the impact of European colonialism, demography, urban and rural relations, trade and exchange, and ceramic technology from the 16th through the 19th centuries. Key issues that run through these papers include archaeological transformations in indigenous economic, political, social and religious systems, as well as the variability and meaning of material culture.” [264] Symposium: *Beyond Pottery Types: Reconsidering Ceramic Design and Technology in the American Southwest*. “Although the ceramic type is an important analytical tool in the American Southwest, typologies often are specific to particular regions and times. For this reason they may cause us to overlook overarching ceramic decorative and technological themes that crosscut ceramic types. The goal of this symposium is to examine patterns that may be missed through typological analyses. We are not criticizing the use of typologies; rather we are suggesting that interpretation of past social relations can be made richer by examining pottery themes through alternative analytical categories.” The paper or poster authors and their titles follow (alphabetical by senior author).

Abbott, David (Arizona State University), Sophia Kelly (Arizona State University), Andrew Lack (Arizona State University) and Margaret Beck (University of Iowa) [187] “The Provenance of Patayan Pottery from the Patayan Enclave at Las Colinas.” Aimers, Jim (SUNY Geneseo) and Helen Haines (Trent University) [243] “The Pottery of Ka’Kabish, Belize.” Arnold, Dean (Wheaton College (IL)), Bruce Bohor (US Geological Survey, retired), Hector Neff (California State University Long Beach), Gary Feinman (Field Museum of Natural History) and Ryan Williams (Field Museum of Natural History) [142] “Indigenous Knowledge and the Sources of Palygorskite Used in Maya Blue.” Asbury, Sophia (Washington State University) [257] “Testing the Limits of Rim Sherd Measurement.” Ashkanani, Hasan (University of South Florida) and Robert Tykot (University of South Florida) [63] “Using non-destructive XRF analysis for sourcing of bronze age ceramics from Kuwait and Bahrain.” Bernal, Judy (California State University Long Beach), Gregory Holk (The Institute for

Integrated Research in Materials, Environments, and Societies, CSU, Long Beach), Carl Lipo (The Institute for Integrated Research in Materials, Environments, and Societies, CSU, Long Beach) and Hector Neff (The Institute for Integrated Research in Materials, Environments, and Societies, CSU, Long Beach) [5, poster] “An Experimental Study of Mineralogical Changes and Hydrogen Isotope Fractionation in Ceramic Pyrotechnology.” Bloch, Lindsay (UNC-Chapel Hill) [207] “Trends in Redware Use and Production in the Chesapeake.” Braun, Gregory (University of Toronto) [55] “Ancestral smoke: social aspects of Iroquoian ceramic production.” Breister, Anne (California State University, Long Beach) and Carl Lipo (California State University Long Beach) [207] “Technological Changes in Brownware from Owens and Death Valleys.” Casson, Aksel (McGill University), James Feathers (University of Washington), Albert Yu-Min Lin (University of California San Diego) and Fred Hiebert (National Geographic) [5, poster] “Luminescence Dating of Ceramic Roof Tiles from Central Asia.” Retitled to “Luminescence Dating of Mongolian Surface Features: Preliminary Dates from Four Archaeological Features.” Cecil, Leslie (Stephen F. Austin State University) [190] “Maya Blue in Central Petén: Further Evidence of the Exchange of Ideas and not Things.” Cheetham, David (Arizona State University) [157] “Cunil Horizon Pottery at Pulltrowser Swamp, Belize.” Chesson, Meredith (University of Notre Dame) and Morag Kersel (DePaul University) [236] “Following the Pots: Groundtruthing a Looted Cemetery, Assessing Loss, and Utilizing What Remains.” Chiu, Scarlett (Academia Sinica, Taiwan) [228] “Stylistic analysis using the online Lapita pottery database: A case study of a Lapita pottery assemblage excavated from Kamgot, Anir Islands, Papua New Guinea.” Cook, Reese (Northern Arizona University) [207, poster] “Raman Spectroscopy: Molecular Signatures through Time.” [Hohokam]. Cordova, Isabel (California State University Northridge) [186] “Determining the Role of Anthropomorphic Figurines in Social Complexity: Is there a Correlation?” Crider, Destiny (Arizona State University) [36] “Ceramic Pastes, Past Connections, and Social Reorganization: Epiclassic and Early Postclassic Interaction in the Basin of Mexico.”

Davenport, James (Tulane University) and Kit Nelson (Tulane University) [142] “Compositional Analysis Using pXRF of Ceramic Pastes and Pigments from the Late Intermediate Period of the North Central Coast of Perú.” Dennett, Carrie (University of Calgary) and Geoffrey McCafferty (University of Calgary) [183] “Pottery and People: Reassessing Social Identity in Pacific Nicaragua.” Drolet, Elizabeth (UCLA/Getty) [220] “Differential burial environments: Effects on low-fired ceramics and

implications for archaeological research Georgia.” Eckert, Suzanne (Texas A&M University) [264] “When is a polychrome? Slips, self-slips, and surfaces during the Pueblo IV period.” Erb-Satullo, Nathaniel (Harvard University), Andrew Shortland (Cranfield University) and Katherine Eremin (Harvard University Art Museum) [5, poster] “Local Wares, Imperial Styles: Identifying Nuzi Ware Production Sites in the Near East through Petrography and Chemical Analysis.” Fehrenbach, Shawn (University of Hawaii at Manoa) and Michael Glascock (University of Missouri Research Reactor Archaeometry Laboratory) [228] “Chemical Compositional Analysis of Late Prehistoric to Early Historic Earthenwares from Five Sites in Cambodia.” Ferguson, Jeffrey (University of Missouri) and Myles Miller (GeoMarine, Inc.) [207] “A Return to Brownwares, Textured Wares, and Redwares from Southern New Mexico and Western Texas: A Reinterpretation of the NAA Data.” Fournier, Patricia (Escuela Nacional de Antropología e Historia) and M. James Blackman (Smithsonian Institution) [200] “Indigenous Post-conquest Ceramics from Mexico-Tenochtitlan and Tlatelolco: Technological and Stylistic Syncretism.” Freiwald, Carolyn (University of Wisconsin), Jason Yaeger (University of Texas at San Antonio), Jaime J. Awe (Belize Institute of Archaeology), Christophe Helmke (University of Copenhagen) and James Garber (Texas State University) [56] “Local Nobility, Imported Ceramics: Isotopic Insights into Mortuary Treatment and Political Authority in the UBRV Belize.” Galentine, Jordan (Indiana University of Pennsylvania) [209] “Analysis of Ceramic Temper and Vessel Lip Characteristics from the Crooked Creek Watershed.” [Pennsylvania]. Garraty, Christopher (Statistical Research, Inc.) [151] “The Post-Conquest Origins of Pottery among the Tongva-Gabrielino: Indigenous Brown Wares from the Ballona.” Gilman, Patricia (University of Oklahoma) and Alison K. Livesay (University of Oklahoma) [143] “Mortuary Data from the Mimbres Region of Southwestern New Mexico.” Giron, Mario (CalState-LA) [266] “Ritualized Gladiatorial Contests in Classic Maya Ceramic Art.” Gomez, Josue (University of Oregon), Douglas Kennett (University of Oregon) and Barbara Voorhies (University of California-Santa Barbara) [5, poster] “Reconsidering Pox pottery: Early Ceramics from Coastal Guerrero.” Gregg, Michael (University of Pennsylvania Museum) [19] “A pilot study and experimental program to improve the efficacy of stable carbon isotopes in categorizing organic residues from early pottery vessels.” [Middle East]. Guernsey, Julia (University of Texas at Austin) [186] “From household to plaza: figurines, sculpture, and the construction of elite identity in the Preclassic.” [Guatemala].

Habicht-Mauche, Judith (University of California Santa Cruz) [264] “Dr. Strangesherd or: How I Learned to Stop Worrying and Love Tijeras White Ware.” Hauser, Mark (Northwestern University) and Jerome Handler (Virginia Institute for the Humanities) [121] “Archaeological implications for the comparison of three cottage industries: Ethnographic and documentary observations about the introduction of the Monkey and Coal Pot.” [Caribbean]. Hedgepeth, Jessica (University of Colorado, Boulder) [5, poster] “A typological and iconographic analysis of Early Postclassic pottery from Río Viejo, Oaxaca, Mexico.” Hirshman, Amy (West Virginia University) and Christopher J. Stawski (Michigan State University) [38] “Paddlers and porters: moving Late Postclassic Tarascan ceramics to market.” Huntley, Deborah (Center for Desert Archaeology), Barbara Mills (University of Arizona), Lara Muncaster (University of Arizona) and William Haas (University of Arizona) [264] “The White-on-red Pottery Phenomenon in the American Southwest.” Hyde, David (University of Texas at Austin) and Fred Valdez (University of Texas at Austin) [34] “Social Memory at an Eastern Maya Lowlands Hinterland Community: Pots and Burials at the Medicinal Trail Site.” Iizuka, Fumie (Fumie Iizuka), Hector Neff (California State University Long Beach) and Richard Cooke (Smithsonian Tropical Research Institute) [228] “Deducing Human Mobility by Studying the Circulation of Panama’s Earliest Pottery (Monagrillo) (ca. 4,800-3,200 B.P.).” Inanez, Javier (University of Barcelona) [208] “Red Shine: Archaeometrical Characterization of Roja Bruñida Pottery from Panama.” Jorgensen, Mia (University at Buffalo) [243] “Resuming the Past: Revisiting Ceramic Materials from Millon, Drewitt, and Bennyhoff’s 1959 Investigations of the Pyramid of the Sun.” Kardulias, Paul (College of Wooster) [6] “The Multi-Component Wansack Site (36ME61): The Prehistoric Longue Durée in Western Pennsylvania.” Klarich, Elizabeth (Smith College) and Andrew Roddick (University of Victoria) [267] “Arcillas and alfareros: Clay and temper mining practices in the Lake Titicaca Basin.” LeBlanc, Kathleen (Simon Fraser University) [5, poster] “Gender Ceramic Ethnoarchaeology in Fiji.” Levine, Abigail (University of California, Los Angeles) [125] “Mold-Made Pottery and Temporal-Spatial Dynamics at Farfán during the Late Horizon.” [Peru]. Lindstrom, Katie (University of Wisconsin-Madison) [189] “Pottery Preferences at Gola Dhoro (Gujarat, India) and Cultural Affiliation Strategies along the Indus Civilization Borderlands.” Lipe, William (Washington State University) and Donna Glowacki (University of Notre Dame) [46] “A Late Pueblo II Period “Surge” of Kayenta Ceramics into Southern Utah.” Lipo, Carl (California State University Long Beach), Hector Neff

(California State University Long Beach) and Jacob Kovalchik (California State University Long Beach) [5, poster] “The Promise and Practicalities of Rehydroxylation Dating for Prehistoric Ceramics.” Loney, Helen (University of Worcester, UK) and Peter van Dommelen (University of Glasgow) [228] “Colonial theory and pottery production: the changing relationships of local workshops during the Punic period, Sardinia.” Long, Michael (University of Texas Austin) [186] “Keeping 'tabs' on the sacred and feminine at La Blanca.” [Guatemala]. Longacre, William (University of Arizona) and Taylor Hermes (University of Arizona) [169] “Ethnoarchaeology of Rice and Pottery Production among the Kalinga, Philippines.” Loughmiller-Newman, Jennifer (University at Albany, New York) [190] “The Construction, Production, and Function of Classic Maya Flask Vessels.” Loya, Tatiana (Brandeis University) [85] “Ideology, Technology and their Implications on the Political Economy: A Petrographic Analysis of a Sample of Arena Red and Arena Orange from Yaxuna, Yucatan, Mexico.” Lukach, Katharine (Brandeis University) [190] “Representation and exchange in Late Classic Mesoamerica: a study of some figurines from the Brandeis University Material Culture Laboratory Collection.”

Mahoney, Daniel (University of Chicago) [228] “Resistance or Isolation: The persistent ceramic tradition of the central highlands in Yemen during the Islamic period.” Marwick, Ben (University of Washington), Anna Cohen (University of Washington), Seungki Kwak (University of Washington), Kimbi Macy (University of Washington) and Andy Cowan (University of Washington) [4] “Geoarchaeology of Iron Age ceramics at Tham Sua Cave, Northern Lao PDR.” Matson, R. (University of British Columbia) and William Lipe (Washington State University) [46] “Two Chaco-style Great Houses on Cedar Mesa--with Kayenta Pottery?” McGill, Dru (Indiana University) [207, poster] “Pottery Production and Social Organization at Angel Mounds (12Vg1), Indiana.” Millaire, Jean-Francois (The University of Western Ontario) [156] “Pots and Posts: Propitiatory Ritual at Huaca Santa Clara in the Virú Valley, Peru.” Mitchell, Seth (Caprock Environmental Services) [209] “New Insights into the Johnston Phase: Ceramic Attributes of the Johnston Site Assemblage.” [Pennsylvania]. Moore, Summer [207] “White Mountain Redware at the Pettit Site, An Aggregation-Period Pueblo in the Zuni District.” Moriarty, Ellen (Boston University) and Antonia Foias (Williams College) [85] “Ceramic Petrography and Political Dynamics in the Central Petén Lakes Region, Guatemala.” Neiman, Fraser (Monticello), Jillian Galle (DAACS), and Barbara Heath (University of Tennessee) [121] “Afro-Caribbean ceramics and the

economic dynamics of slave-village life on Nevis and St. Kitts.” Nelson, Kit (Tulane University) and James Davenport [63] “Compositional Analysis Using pXRF of Ceramic Pastes and Pigments from the Late Intermediate Period of the North Central Coast of Perú.” O'Brien, Lauren (Southern Methodist University), B. Sunday Eiselt (Southern Methodist University) and Felipe Ortega [207, poster] “Thermal Efficiency and Durability of Micaceous Clay Cookware from the Northern Rio Grande: An Experiment.” Ortman, Scott (SFI/Crow Canyon) [264] “Pottery style and the Mesa Verde migration: new evidence from Tsama Pueblo, New Mexico.” Pagliaro, Jonathan (Southern Methodist University) [85] “Refined Methodology for the Investigation of Contextual Influences on Prehistoric Maya Ceramic Assemblages.” Parsons, Jeffrey (University of Michigan) [200] “Is Aztec IV Black/Orange pottery Late Postclassic, or Early Colonial, or both, and does it matter?” Pawlowicz, Matthew (University of Virginia) [228] “Early 2nd-Millennium Ceramics at Mikindani, Tanzania and Implications of Ceramic Differentiation for Swahili Communities.” Pereira, Carla (California State University Long Beach) [207, poster] “Transmission Patterns among Late Prehistoric Potters of Mississippi River Valley Ceramics.” Perez, Don (EBI Consulting) [243] “Petrographic Analysis of Potsherds from the Ancient Maya Site of Copan.” Pihl, Robert (Archaeological Services Inc.), Jennifer Birch (University of Georgia), Aleksandra Pradzynski (Archaeological Services Inc.) and Robert Wojtowicz (Archaeological Services Inc.) [55] “Multi-scalar perspectives on Iroquoian ceramics: A re-examination of the West Duffins Creek site sequence.” Pillsbury, Joanne (Dumbarton Oaks) [125] “Architecture and Ritual on a Lambayeque Vessel.” Poeppel, Emily (Indiana University of Pennsylvania) [65] “An Analysis of Ceramics from the Johnston Site, Indiana County, Pennsylvania.” Prikhodko, Sergey (UCLA) [220] “At the interface between materials science and archaeology: new approaches to the metrology of ancient materials.” [variable pressure SEM-EDS]. Pye, Jeremy (University of Florida) [235] “Faces from the Past: History of Ceramic Memorial Portraits on Grave-Markers.”

Ramirez-Urrea De Swartz, Susana (Universidad de Guadalajara) [98] “The anthropomorphic representation in the Aztatlan Tradition (850-1300 AD), Western Mexico. An approach.” Reber, Eleanora (UNC Wilmington) and Matthew Kerr (UNC Wilmington) [19] “Diagenesis and Soil-Sherd Interactions in Experimentally Produced Black Drink Residues.” Rosenstein, Dana (University of Arizona), Robert T. Downs (University of Arizona) and Pamela Vandiver (University of Arizona) [5, poster] “Structure and

function: mineralogical analyses of tempers in Late Iron Age ceramics from southern Africa using optical petrography, x-ray diffraction and Raman spectrometry.” Sakai, Sachiko (University of California Santa Barbara) [62] “Applications of Optically Stimulated Luminescence (OSL) Dating in the Study of Change in Clay Source of Olivine-tempered Ceramics in the Arizona Strip and Adjacent Areas in the American Southwest.” Sall, Candace (University of Missouri) [62] “Pigments and Pastes: Polychrome Ceramics from the 76 Draw Site, New Mexico.” Sanchez Fortoul, Carmen (University of Leicester) [243] “Mayapán Pottery Materials: A Petrographic Analysis.” Schneider, Seth (University of Wisconsin Milwaukee) and John D. Richards (University of Wisconsin Milwaukee) [104] “The Schlage Site Ceramic Assemblage: A Comparative Perspective on a New Oneota Variant in Eastern Wisconsin.” Schulenburg, Marcus (University of Wisconsin-Milwaukee) [187] “Ceramic Analysis in the Miami Valleys: Using Clay Sourcing to Determine Intraregional Contact within the Fort Ancient Tradition.” Scott, Ann (The University of Texas at Austin) [266] “Some Preliminary Observations on the Midnight Terror Cave Ceramic Assemblage.” [Belize]. Shiratori, Yuko (The Graduate Center, CUNY) and Miriam Salas (Centro Universitario de El Petén) [243] “Ceramics of the Itza Maya in the Petén Lakes Region.” Shockey, Paul (Arizona State University) [36] “Having the Choice: Thermal Resistance and PIXE Analyses of Woodland Period Ceramics” [Illinois]. Sillar, Bill (Institute of Archaeology, University College London) [269] “Serving Suggestions: Characterising Pottery Use at an Inka Waqa.” Silverstein, Jay (JPAC/U of Hawaii), Robert Littman (University of Hawaii), Joshua Trampier (University of Chicago), Nicholas Hudson (University of North Carolina, Wilmington) and Daniel Jones (University College of London) [258] “Kilns, Harbors, and Temples: Excavations of the Ptolemaic Occupation on the Northern Edge of Tell Timai, Egypt.” Smith, Erica (University of West Florida) [89] “Spanish and Mexican Indian Artifacts from the Emanuel Point Shipwrecks.” [California]. Smith, Karen, Sara Bon-Harper (Monticello) and Fraser Neiman (Monticello) [207] “Site Structure and Slavery at Monticello Plantation in the Late 18th Century.” Snow, David (Cross-Cultural Research Systems) and Kari Schleher (University of New Mexico) [264] “Read Their Lips: function and habitus in early Rio Grande glazeware bowl rims.” Spivak, Deborah (University of California Santa Barbara) [229] “The Visual Frontier of Huaca del Loro. Peru.” Stanton, Travis (Universidad de las Américas Puebla) [85] “Ceramic Ethnoanalysis at Yaxuná, Yucatán.” Stapleton, Charles (Northern Illinois University) and Maria Stapleton (Northern Illinois University) [170] “Burning

for the Gods: Ceramic Incensarios/Braseros as Indicators of Cultural Continuity and Disjunction in Postclassic Central Mexico.” Steinbrenner, Larry (Red Deer College) [183] “The Pacific Nicaragua Potting Tradition, AD 800-1350.” Stevens, Stanley (University of South Florida), Barney Venables (University of North Texas), Steve Wolverton (University of North Texas), Andrew Barker (University of North Texas) and Kent Seeley (University of South Florida) [19] “Development of Mass Spectrometry-based Methods for Protein Residue Analysis.” Stovel, Emily (IIM-UCN and Ripon College) [228] “pXRF on the South-Central Andean Ceramic Collections at the Field Museum in Chicago.”

Testard, Juliette (Paris 1 / UMR 8096 Archéologie des Amériques) [98] “Personificadoras de Xochitecatl: las figurillas femeninas de la Pirámide de las Flores.” Trask, Garrett (Arizona State University) and Matthew Peeples (Arizona State University) [36] “Ceramic Design and Changing Scales of Social Interaction across the Cibola Region: A.D. 1150-1325.” Ure, Scott (Brigham Young University) [187] “Fremont Pottery Standardization: A Preliminary Examination of Fremont Painted Bowls and their Degree of Standardized Morphological Characteristics.” Urunuela, Gabriela (Universidad de las Americas) and Patricia Plunket (Universidad de las Américas, Puebla) [98] “Costumes and Puppets among Cholula's Early Classic Figurines.” Varela-Torrecilla, Carmen (Associate Researcher CNRS-Teacher La Salle Campus) [85] “One Question, Many Answers: History and Results of an Archaeometric Research of Puuc Ceramics.” Wambach, Thomas (Indiana University of Pennsylvania) [209] “Firing Techniques and their Effects on Susquehannock Ceramic Vessels.” Watts, Christopher (Royal Ontario Museum) [55] “Points of passage/points of view: Iroquoian animal effigy pipes and the crossing of corporeal borders.” Webb, Monica (University of Tulsa) [187] “A Design Analysis of Ramos Polychrome, Babicora Polychrome, and White Paste Babicora Polychrome Ceramic Shards From Test Pits at Site 204, Casas Grandes Region, Chihuahua, Mexico.” Weismantel, Mary (Northwestern University) [24] “Moche Ceramics as Political Actors.” Weitkamp, Matthew and Kylie Quave (Southern Methodist University) [5, poster] “Evaluating Inka Ceramic Production through Horizontal Excavation (Cusco, Peru).” Werness, Maline (St. Edward's University) [102] “Space Men: Patrons' and Artists' Use of Ceramic Space to Construct Ideology.” [Maya]. Wiewel, Rebecca (University of Arkansas) [187] “Regional Interaction in the Central Arkansas River Valley: Stylistic and Compositional Analysis of Carden Bottoms Phase Ceramics.” Zovar, Jennifer (Vanderbilt University) [228] “Community Formation in Post-Collapse Context:

Results from a Ceramic Analysis at Pukara de Khonkho, Bolivia.”

Middle Atlantic Archaeological Conference. The MAAC conference was held 17-20 March 2011 in Ocean City Maryland, USA. A session, “The Woodland: Ceramics, Shell Middens, Caches, and Inhumations,” included “Page Coad-Marked and the Huffman Phase” by Robert Maslowski (Marshall University). Four other papers were scattered over the 16 sessions: “One More Bowl and Then: A Material Culture Analysis of Ceramic Punch Bowls” by Eleanor Breen (Historic Mount Vernon); “XRF Analysis of Ceramic Sherds Found at Chesapeake Bay Archaeological Sites” by Emilie Campbell (St. Mary’s College of Maryland); “Stone Mugs, A Beare Room, and Three Brass Cocks: Beer Brewing and English Brown Stoneware in the 17th Century Chesapeake” by Jerry Warner (St. Mary’s College of Maryland); and “Pottery of the Threemile Creek Rockshelter (46MS305) Beyond Sherd Counts” by Christopher Espenshade (New South Associates, Inc.).

2011 Trenton Ceramics Symposium. This year’s day-long Potteries of Trenton Society’s ceramics symposium “Skin Deep: Trenton’s Decorating Trade” was held Saturday, 2 April 2011, at the New Jersey State Museum and the galleries of the Trenton City Museum at Ellarslie Mansion. The presentations focused on the many facets of Trenton’s ceramics decorating industry at the turn of the twentieth century which had numerous sub-industries that feed into it and off of it. In Trenton these sub-industries included merchants who dealt in raw materials and specialized machinery as well as independent decorating workshops. The workshops provided mass market decorations as well as custom painting on order to the potteries or to retailers and middlemen in the retail business. Historian and author Regina Lee Blaszczyk presented the keynote address, explaining how the workshops supplied the potteries with decorations and decorators and highlight the work of selected decorating shops. Other speakers focused on the current exhibition at Ellarslie, “Artists and Decorators of the Trenton Pottery Industry,” which is on view until 8 May 2011, see www.ellarslie.org. The afternoon featured a “show and tell” session during which audience members brought items decorated in Trenton for the experts to examine and discuss. Additional information is available on the Web site: <http://www.potteriesoftrentonsociety.org/events/decorating.html>

Society for Pennsylvania Archaeology 82nd Annual Meeting. The SPA’s annual meeting was held in Morgantown, PA, USA 8-11 April 2011. There were

two papers on ceramics among the two dozen presentations: “Computational Archaeology: A New Way of Looking at Independence Park Ceramic Remains” by Patrice L. Jeppson (Drexel University and PAF) and “New Insights into the Johnston Phase: Ceramic Style at the Johnston Site” by Seth T. Mitchell (Indiana University of Pennsylvania).

Forthcoming Meeting

ISAC 2012. The Shanghai Research Society of Science and Technology of Ancient Ceramics (SRSSTAC), has announced that they have organized the 2012 International Symposium on Ancient Ceramics (ISAC 2012) that will be held in Jingdezhen, Jiangxi, China, 23-27 October 2012. The symposium is sponsored by the Shanghai Institute of Ceramics, Chinese Academy of Sciences, and the Jingdezhen Ceramic Institute. Individuals wishing to present papers are required to submit two copies of the title of the work plus 700-1000-word abstract no later than 30 June 2011. Additional information is available at the symposium Web site at <http://www.ssac.org.cn>, email luxiaoke@mail.sci.ac.cn.

ARCHAEOLOGICAL CHEMISTRY

Ruth Ann Armitage, Associate Editor

SAS members who are also members of the American Chemical Society hopefully noticed the recent article “Chemistry Unlocks Ancient Secrets” in the March 7, 2011 issue of *Chemical and Engineering News*. Covering topics from strontium isotopes to lipid residues for understanding the domestication of horses in Kazakhstan, the article is a nice overview of a few recent papers. If you’d like to see the article and are not an ACS member, I’d be happy to send you a copy if you email me your request.

Several recent publications in ACS journals may be of interest to the membership as well. *Analytical Chemistry* featured the following articles in early 2011:

- Leo, G., I. Bonaduce, A. Andreotti, G. Marino, P. Pucci, M. P. Colombini and L. Birolo
Deamidation at Asparagine and Glutamine As a Major Modification upon Deterioration/Aging of Proteinaceous Binders in Mural Paintings.
Analytical Chemistry 83(6): 2056.

- Sanyova, J., S. Cersoy, P. Richardin, O. Lapr evote, P. Walter and A. Brunelle Unexpected Materials in a Rembrandt Painting Characterized by High Spatial Resolution Cluster-TOF-SIMS Imaging. *Analytical Chemistry* 83(3): 753.
- Thoury, M., J.-P. Echard, M. R efr egiers, B. Berrie, A. Nevin, F. d. r. Jamme and L. c. Bertrand Synchrotron UV–Visible Multispectral Luminescence Microimaging of Historical Samples. *Analytical Chemistry* 83(5): 1737.

Other publications of interest that may have been hiding out in the chemistry journals include:

- Remazeilles, C.; Saheb, M.; Neff, D.; Guilminot, E.; Tran, K.; Bourdoiseau, J. A.; Sabot, R.; Jeannin, M.; Matthiesen, H.; Dillmann, P.; Refait, P., Microbiologically influenced corrosion of archaeological artefacts: characterisation of iron(II) sulfides by Raman spectroscopy. *Journal of Raman Spectroscopy* 41, (11), 1135-1143.
- The March 2011 issue (Vol. 399, Issue 9) of *Analytical and Bioanalytical Chemistry* was devoted to Analytical Chemistry in Cultural Heritage. Topics include patinas on archaeological metals, analysis of paints, and identification of proteins in residues.

Again this year, *Pittcon* featured a poster session “Analytical Instrumentation Applied to Art and Archaeology.” Of special note were the following student presentations:

- *An Analytical Approach to the Detection and Quantification of Caffeine and Theobromine in Native American Pottery* ERIN N CAPLEY, University of South Alabama, Gregory Waselkov, Alexandra C Stenson.
- *Pigments in Dunhuang Wall Paintings* WEIQING XU, Jilin University, Jingjing Chang, Wenyan Zhang, Shuping Xu, Bomin Su.
- *Development of GC-MS and DART-MS Methods for the Qualitative and Quantitative Analysis of Carbohydrates in Rock Paintings* BADRINATH DHAKAL, Eastern Michigan University, Ruth Ann Armitage.

- *Provenance of Metal Artifacts Based on ICP-MS, LA-ICP-MS and Portable X-ray: An Evaluation of Techniques* JAMES THOMPSON, Millsaps College, Jiyan Gu, Timothy J Ward.

As always, please feel free to contact me to bring other items of archaeological chemistry interest to my attention. Watch here in future issues for updates on the upcoming Archaeological Chemistry Symposium at the ACS National Meeting in 2013.

ARCHAEOMETALLURGY

Thomas R. Fenn, Associate Editor

The column in this issue includes the following categories of information on archaeometallurgy: 1) New Articles/Book Chapters; 2) Previous Meetings; and, 3) Forthcoming Meetings.

New Articles/Book Chapters

From the book *West African Archaeology: New developments, new perspectives*, edited by Philip Allsworth-Jones, BAR International Series 2164, Archaeopress, Oxford, 2009, comes a chapter entitled “Recent Developments in iron-working research in West Africa” (Len Pole ; pp. 53-65).

The 2009 issue of *ArcheoSciences: Revue d'Arch om trie* was dedicated to papers on gold metallurgy from around the world. Contributions to the special issue, *Authentication and Analysis of Goldwork* (ISBN 978-2-7535-1181-1), were divided into five main sections. The volume was introduced with a paper by Maria Filomena Guerra and Thilo Rehren entitled “AURUM: Archaeometry and authenticity of gold” (pp. 13-18). Further details and abstracts of the papers, both in English and French, can be found at the following link: <http://archeosciences.revues.org/1892>.

Papers in the first section, *Materials and Methods: The Foundations*, comprised “Wands in the hand! Or Potter’s powers” (Alicia Perea; pp. 21-28), “Targeting Ion Beam Analysis techniques for gold artefacts” (Guy Demortier; pp. 29-38), “Synchrotron Radiation Induced X-Ray Fluorescence for the characterization of ancient gold objects” (Martin Radtke, Uwe Reinholz, Heinrich Riesemeier; pp. 39-44), “X-ray Diffraction method for determination of crystallite sizes of gold and silver items – New opportunities for archaeology and for protection against forgery” (Denka Yanakieva, Milena Tonkova,

Ernst Spiridonov, Zlatil Vergilov, Petia Penkova; pp. 45-50), “A multi-analytical approach for the identification of technological processes in ancient jewellery” (Daniela Ferro, Vania Virgili, Adelia Carraro, Edilberto Formigli, Lorenzo Costantini; pp. 51-57), “Helium, uranium and thorium analyses of ancient and modern gold objects: estimates of their time of manufacturing” (Otto Eugster, Ernst Pernicka, Michael Brauns, Alex Shukolyukov, Valerie Olive, Stefan Roellin; pp. 59-66), “Modern mineralogy of gold: overview and new data” (Ernst Spiridonov, Denka Yanakieva; pp. 67-73), “Bronze Age gold in Southern Georgia” (Andreas Hauptmann, Sabine Klein; pp. 75-82), “Mineralogy and lead isotope signature of the gold-silver ores exploited during the Roman period at Alburnus Maior (Rosia Montanà, Romania)” (Călin Gabriel Tămaș, Sandrine Baron, Béatrice Cauuet; pp. 83-89), and “The earliest gold objects in Italy: a review of the archaeological evidence” (Giovanna Bergonzi; pp. 91-97).

Contributions in the second section, *Studies of Objects: Manufacturing Skills and Alloy Selection*, consisted of “Gold in early Southeast Asia” (Anna T. N. Bennett; pp. 99-107), “Technological study of gold jewellery pieces dating from the Middle Kingdom to the New Kingdom in Egypt” (Lore G. Troalen, Maria Filomena Guerra, Jim Tate, Bill Manley; pp. 111-119), “The 17th Dynasty gold necklace from Qurneh, Egypt” (Jim Tate, Katherine Eremin, Lore G. Troalen, Maria Filomena Guerra, Elizabeth Goring, Bill Manley; pp. 121-128), “Preliminary observation on three Late Bronze Age gold items from Ras Shamra-Ugarit (Syria)” (Romain Prévaut; pp. 129-133), “The Mycenaean tomb of Kazanaki (Volos) and the myth of the Golden Fleece” (Vassiliki Adrimi-Sismani, Maria Filomena Guerra, Philippe Walter; pp. 134-142), “The Phoenician gold jewellery from Kition, Cyprus” (Pavlos Flourentzos, Maria Luisa Vitobello; pp. 143-149), “In-situ examination and analysis of the gold jewellery from the Phoenician tomb of Kition (Cyprus)” (Maria Filomena Guerra, Thilo Rehren; pp. 151-158), “New finds from an old treasure: the archaeometric study of new gold objects from the Phoenician sanctuary of El Carambolo (Camas, Seville, Spain)” (Alicia Perea, Mark A. Hunt-Ortiz; pp. 159-163), “Two small orientalisng spirals (Rome, 10th-9th century BC) common objects – precious jewels” (Daniela Ferro, Alessandro Bedini, Ida Anna Rapinesi; pp. 165-168), “Investigation of ancient gold objects from Artemision at Ephesus using portable μ -XRF” (Michael Melcher, Manfred Schreiner, Birgit Bühler, Andrea M. Pülz, Ulrike Muss; pp. 169-176), “Analytical study of the manufacturing techniques of Kushan gold jewellery (National Museum of Antiquities of Tajikistan)” (Maria Filomena Guerra, Guy Demortier, Maria Luisa Vitobello,

Saidmurod Bobomulloev, Dominique Bagault, Thierry Borel, Ikhom Mirsaidov; pp. 177-185), “Gold technology of the ancient Scythians – gold from the kurgan Arzhan 2, Tuva” (Barbara Armbruster; pp. 187-193), “Funeral golden mask and hand with a ring The necropolis of Trebeniste” (Pavlina Ilieva, Petia Penkova; pp. 194-200), “The gold jewellery from the Thracian necropolis of Duvanli (5th century BC): the case of the Kukova mound” (Milena Tonkova, Petia Penkova; pp. 201-209), “The technique of gold inlaid decoration in the 5th-4th centuries BC: silver and iron finds from the early Sarmatian barrows of Filippovka, Southern Urals” (Marina Shemakhanskaya, Mikhail Treister, Leonid Yablonsky; pp. 211-220), “Dacian bracelets and Transylvanian gold: ancient history and modern analyses” (Bogdan Constantinescu, Roxana Bugoi, Viorel Cojocar, Martin Radtke, Thomas Calligaro, Joseph Salomon, Laurent Pichon, Stefan Röhrs, Daniele Ceccato, Ernest Oberländer-Târnoveanu, Corine Ionescu, Dana Pop; pp. 221-225), “The gold belt buckle from Apahida III (Romania), 5th century AD” (Rodica Oanta-Marghitu, Gheorghe Niculescu, Doina Seclâman, Roxana Bugoi, Migdonia Georgescu; pp. 227-233), “‘More like the work of fairies than of human beings’: the filigree on the ‘Tara’ brooch, a masterpiece of late Celtic metalwork” (Niamh Whitfield; pp. 235-241), “From the goldsmith’s point of view: Gilding on metals during the first millennium AD – techniques and their development in the Germanic area” (Iris Aufderhaar; pp. 243-253), “Gold foil covering of the handle of an iron knife from burial 2 of the Hunnic Period cemetery at Mukhino, in the Upper Don area” (Saprykina Irina, Yurii A. Teterin, Robert Mitoyan; pp. 255-257), “The wire ‘at astragals’, or beaded wire: From medieval tradition to the technique and tools used by the Roman goldsmiths Castellani in the 19th century” (Maurizio Donati; pp. 259-263), and “The jewellery from the casket of Maria Pia of Savoy, Queen of Portugal, produced at Castellani’s workshop” (Maria José Oliveira, Teresa Maranhas, Ana Isabel Seruya, Francisco A. Magro, Thierry Borel, Maria Filomena Guerra; pp. 265-270).

Papers in the third section, South America: Gold Studies in the New World, comprised “Pre-Columbian archaeology and science-based analysis: the figurine of El Angel, a composite goldwork from La Tolita Tumaco culture (Ecuador – Colombia)” (Jean-François Bouchard, Maria Filomena Guerra; pp. 273-279), “Pre-Columbian alloys from the royal tombs of Sipán and from the Museum of Sicán: Non-destructive XRF analysis with a portable equipment” (Roberto Cesareo, Angel Bustamante, Julio Fabian, Cristina Calza, Marcelino dos Anjos, Ricardo T. Lopes, Walter Alva, Luis Chero, Fidel Gutierrez, Maria del Carmen Espinoza, Rosendo Rodriguez, Marco Seclen, Victor Curay, Carlos Elera,

Izumi Shimada; pp. 281-287), "Technological and material features of the gold work of Mesoamerica" (José Luis Ruvalcaba Sil, Gabriela Peñuelas Guerrero, Jannen Contreras Vargas, Edith Ortiz Díaz, Eumelia Hernández Vázquez; pp. 289-297), "Technological study of pre-Columbian bimetallic discs from Monte Alban, Oaxaca, Mexico" (Gabriela Peñuelas Guerrero, Jannen Contreras Vargas, José Luis Ruvalcaba Sil, Ángel García Abajo; pp. 299-302), "Location of gold placers in Oaxaca: The late pre-Hispanic period and early Colonial times: 1250 to 1550 AD" (Edith Ortiz Díaz; pp. 303-307), "The first gold coins struck in Brazil: myth or reality?" (Mathieu Duttine, Maria Filomena Guerra, Rejane Maria Lobo Vieira, Rosa B. Scorzelli, Carlos Eduardo Pereira, Carlos A. Perez; pp. 309-312), "Precious metals determination in ancient coins by portable ED-XRF spectroscopy with a ²³⁸Pu source" (Paulo S. Parreira, Carlos R. Appoloni, Rejane M. Lobo Vieira, Rosa B. Scorzelli, Laetitia Le Corre, Maria Filomena Guerra; pp. 313-318), and "Gold jewellery of devotional images in Campeche State, Mexico" (Eva Brito, Feliciano Chaire; pp. 319-326).

Contributions in the next section, *Authentication: Applying Expert Knowledge*, consisted of "Forgeries and public collections" (Susan La Niece; pp. 329-333), "The analysis of micro-scratches and trace-wear in the authentication of archaeological gold" (Edilberto Formigli; pp. 335-339), "A new approach to the authentication of goldwork: Using combined Scanning Electron Microscopy and External-beam PIXE" (Olivier Bobin, Hervé Guegan; pp. 341-347), "Copy or authentic? Analysis of a Phoenician gold ring from the National Museum of Archaeology, Valletta, Malta" (Daniel Vella, James Licari, Nicholas Vella, Sharon Sultana, Vanessa Ciantar; pp. 349-355), "Modern and ancient gold jewellery attributed to the Etruscans: a science-based study" (Anna Rastrelli, Marcello Miccio, Lore Troalen, Marcos Martín-Torres, Maria Filomena Guerra, Salvatore Siano, Andrej Sumbera, Maria Luisa Vitobello; pp. 357-364), "Gold Thracian appliqué: authentic or fake?" (Ivelin Kuleff, Totko Stoyanov, Milena Tonkova; pp. 365-373), and "A unique 10th century AD gold-plated brooch from south-east Russia: technical and stylistic authentication" (Natasha Eniosova; pp. 375-380).

Papers in the final section, *Restoration and Conservation*, comprised "Observations and questions on gold artefacts from underwater excavations: The view of an archaeologist-restorer working *in situ*" (Olivier Berger; pp. 383-387), "Treasures of Portuguese archaeology Notes towards a preventive conservation project" (Isabel Tissot, Matthias Tissot, Pedro Pedroso, Luís Raposo; pp. 389-392), "Ancient gold patinas: experimental reconstruction" (Alessandro Pacini; pp. 393-396), "The

illusion of gold Imitation of gilding in mediaeval mural paintings" (Aurélie Mounier, Floréal Daniel, Françoise Bechtel; pp. 397-403), "Gold leaf in 14th century Florentine painting" (Giovanni Buccolieri, Alessandro Buccolieri, Susanna Bracci, Federica Carnevale, Franca Falletti, Gianfranco Palam, Roberto Cesareo, Alfredo Castellano; pp. 409-415), "Gilding on wall paintings from a period: Between the 14th-16th centuries AD in the Lombard lake region" (Giovanni Cavallo, Marcel Verda; pp. 409-415), "Gold leaf analysis of three baroque altarpieces from Porto" (Ana Bidarra, João Coroado, Fernando Rocha; pp. 417-421), and "The main altarpiece of the Old Cathedral of Coimbra (Portugal): Characterization of gold alloys used for gilding from 1500 to 1900" (Agnès Le Gac, Ana Isabel Seruya, Michel Lefftz, Adília Alarcão; pp. 423-432).

From the inaugural issue of the journal *IANSA - Interdisciplinaria Archaeologica: Natural Sciences in Archaeology* (2010, Vol. 1, Nos. 1-2) come "Bell Beaker Metallurgy and the Emergence of Fahlore-copper Use in Central Europe" (Matthias B. Merkl; pp. 19-27), while from *Archaeometry* (2011, Vol. 53, No. 1) comes "An Experimental Investigation on Lead Isotopic Fractionation during Metallurgical Processes" (Jianfeng Cui, Xiaohong Wu ; pp. 205-214).

From *Bulletin de l'Institut français d'études andines* (2010, Vol. 39, No. 2), comes "The Oedt sword: a note on brass and fire-gilding in the European Bronze Age" (Michel Pernot; pp. 331-350), and "Estudio arqueometalúrgico de un taller de transformación de cobre y de aleaciones *tumbaga* en el sitio de huacas de Moche" (Carole Fraresso; pp. 351-387). From *Arqueología y Territorio* (2010, Vol. 7) comes "Minería romana en La Serena. La fotointerpretación como herramienta para el análisis morfológico" (María Isabel Roger Salguero; pp. 105-118).

Forthcoming Meetings and Conferences

Tecniche dell'Oreficeria Etrusca: Seminario di specializzazione in oreficeria antica [*Technologies of the Etruscan Jewelry: Seminar of Specialization in Ancient Jewelry*], will be held three times in 2011 on April 18-21, August 24-27, and October 29-November 1, in Montepulciano (Siena). More information, including details of cost and location, can be found at: www.aliseda.it/alessandro/lessons.htm.

Bronzi Preistorici: Seminario di specializzazione in archeometallurgia [*Prehistoric Bronze: Seminar of Specialization in Archaeometallurgy*], will be held twice in 2011, on June 1-4, and September 1-4, in

Montepulciano (Siena). More information, including details of cost and location, can be found at: <http://www.aliseda.it/alessandro/lessons-bronze.htm>.

Previous Meetings and Conferences

The *Archéométrie 2011* meeting was held April 11-15, 2011, at the Université de Liège, Belgium. Two sessions were dedicated to papers on metallurgy and archaeometallurgy papers and posters were scattered throughout other sessions. These contributions included “Productions en laiton et en alliages a base de cuivre au Moyen Age dans la vallée de la Meuse (Belgique) : techniques et formes du marché” (N. Thomas, D. Bourgarit, J. Plumier, M. Verbeek), “L'influence des refontes dans le monnayage en orichalque de l'empire romain : expérimentation et analyses élémentaire” (A. Gaffiero, B. Gratuze, F. Teyregeol, A. Suspene), “Considérations techniques sur des objets en alliages a base de cuivre du XVIIe siècle : nord-est de l'Amérique du nord et sud-ouest de la France” (J.-F. Moreau, M. Pernot, F. Daniel, A. Ben Amara, R.G.V. Hancock), “The Rammelsberg source of copper and lead in high medieval times - a reconstruction of the smelting technology” (B. Asmus, L. Klappauf, F.-A. Linke, C. Bartels), “Grillage réaction de la galène au four à réverbère dans le nord-est argentin : comparaison expérimentation-archéologie” (M.-F. Becerra, J. Gauthier, C. Angiorama, F. Tereygeol, I. Guillot, N. Nieva), “L'or de gaule Belgique : l'apport des analyses métalliques dans la compréhension des monnaies d'or gauloises (IIIème-Ier s. avant J.C.)” (C. Sillon, B. Gratuze, S. Fichtl, S. Nieto-Pelletier), “D'où vient le fer des cathédrales ? Approche multidisciplinaire de la provenance des éléments ferreux dans l'architecture” (M. L'Heritier, S. Leroy, B. Gratuze, Ph. Dillmann), “Présentation du CAI-RN (Compétences Archéométriques Interdisciplinaires-Réseau National)” (Ph. Dillmann), “L'utilisation du fer dans la construction médiévale mosane : explications et premiers repères d'une évolution” (C. Maggi, G. Pages, P. Hoffsummer, F. Mathis, A. Mertens), and “Iron nails in late mediaeval carpentry” (D. J. de Vries).



BOOK REVIEWS

David Hill, Associate Editor

Ritual and Trade in the Pasión-Verapaz Region, Guatemala. Brent Woodfill. Vanderbilt Institute of Mesoamerican Archaeology Series, Volume 6, Vanderbilt University Press, Nashville, TN. 2010. 240 pp., 189 ill. Price: US\$69.95 (cloth), ISBN: 9780826516480.

Reviewed by Holley Moyes, Assistant Professor of Anthropology, School of Social Science, Humanities, and Arts, University of California, Merced, CA 95344.

Ritual and Trade is a monograph based on Woodfill's 2007 dissertation project with the Vanderbilt Upper Pasión Archaeological Cave Survey (VUPACS), Vanderbilt University. Woodfill is currently a visiting assistant professor in the Department of Sociology and Anthropology at the University of Louisiana, Lafayette. The study is an analysis of Maya ceramics found primarily in caves located in the Upper Pasión and Alta Verapaz areas of Guatemala. The region is thought to intersect the Precolumbian Great Western Trade Route postulated by Arthur Demerast and Frederico Fahsen, which was a geographic nexus that saw highland, northern highland and lowland influences during its 2000-year history.

The project began in 2001 and is ongoing. A total of 70 caves were (re)discovered by VUPACS, but not all were incorporated into Woodfill's regional study, which included 16 caves from the spectacular Candelaria cave system, one of the longest in Mesoamerica, 12 caves from the San Francisco Hills near the surface site of Cancuen, and Hun Nal Ye, an unlooted site in the southern part of the region. Woodfill's team, also excavated three settlements: La Lima and Muqb'ilha' Viejo, associated with the Candelaria system, and La Caoba Vieja, associated with the San Francisco Hills. The project analyzed over 70,000 sherds between 2004 and 2008.

Caves in Mesoamerica are almost exclusively used as ritual sites beginning in the Early Preclassic Period (1200 B.C.) and extending into modern times. Beginning with James Brady's 1989 dissertation on Naj Tunich Cave in Guatemala, Maya cave studies have typically focused on the ritual nature of the deposits, but counter to these studies, Woodfill set out to demonstrate that ritual remains can address issues that extend beyond ritual

behaviors such as the assessment of trade patterns or assignments of ethnic identity. Using the ceramics found in ritual cave contexts, his goal was to document changes in the geopolitical spheres of influence in the region over time by employing a type-variety analysis. The type-variety system is well-developed in the Maya lowlands, and the technique has made it possible to compare styles and establish chronological sequences to within 100-150 years in many cases. Although the method relies heavily on surface treatments for characterization, it is commonly used for the analysis of Maya cave assemblages, firstly because ceramic slips in caves tend to be well-preserved and therefore easily typed, and secondly because deposits are often surface finds with a palimpsest nature, which are notoriously hard to date using other means.

The bulk of the volume is a treasure trove of data that will be useful to archaeologists for years to come. Chapter 3 is devoted to thick description of the caves themselves, which includes maps with cave locations and detailed tunnel maps with insets illustrating the provenience of ceramic caches and constructed features. There are few photographs in the volume, but importantly, *in situ* photos of intact ceramic vessels and a rare carved stone box with a glyphic text are included for the site Hun Nal Ye. Not often do cave archaeologists encounter unlooted contexts so this data is particularly valuable for future study. Tragically, the site was looted following the team's initial survey. Eight of the finest vessels were stolen, other intact vessels smashed, and the stone box removed, though it was eventually recovered.

Chapters 5-8 are devoted to the ceramic analysis. The data is grouped by temporal period beginning with the Early Preclassic (1000-800 B.C.) and moving into the Terminal Classic (800-1000 A.D). Only two Postclassic (950-1300 A.D.) vessels were found in the entire assemblage, which did not support sustained cave use after the Terminal Classic period. Ceramics are described by group and based on attributes type-variety designations are provided and compared to similar examples both intraregionally and interregionally. Selected vessels and sherds are illustrated and decorations drawn. Non-ceramic artifacts are described and discussed in Appendix A.

Chapter 9 is a discussion of ritual activities occurring in the caves that draws some comparisons with other Maya cave sites. Although this is one of the volume's thinnest chapters, Woodfill poses a number of interesting topics, any of which could have served as alternative dissertation questions. In Chapter 10, he is able to posit changing interactions between the highlands and lowlands, meeting his initial goals, but in the process, some curious patterns

of cave use are uncovered that have no easy explanations. As it turns out, the huge Candelaria system reaches its peak usage (in terms of the number of sherds analyzed) in the Early Classic period, yet there does not appear to be an equally large local settlement in vicinity, though it has only be partially surveyed. Even stranger, the vessels found in the cave appear to be locally made, though the types are reminiscent of the lowlands, suggesting that the potters are catering to people with lowland Peten stylistic tastes. Woodfill attributes this pattern to the purchase of locally-produced vessels to transient non-locals for use as cave offerings, a practice that has been demonstrated ethnographically at shrines in the Andes. He refers to the sites as "trade shrines," and differentiates them from pilgrimage sites in that they are not the ultimate destination of the traveler (p. 269).

While this is an interesting idea, it is difficult to prove archaeologically, particularly due to the lack of systematic survey data. Woodfill brings the crux of the issue to the forefront, when he laments "...all of this clearly illustrates the need to conduct a comprehensive research program that includes both settlement and sacred sites—running a cave investigation in tandem with a regional settlement survey will provide a more holistic perspective on the history of the region" (p.278-279). I see this sentiment as prophetic and in fact crucial to the future development of cave archaeology. Its greatest contributions have yet to be realized and may be expected to emerge from approaches in which caves are woven into the broader social fabric rather than existing in isolation as "ritual sites."

This volume represents a significant contribution to Maya studies as well as to cave archaeology. Woodfill is to be commended for his detailed reporting and ceramic characterizations for such a large number of sites in a region that is not well-known to cave archaeologists working in other areas. His data is ageless and will continue to inform archaeologists in years to come.

UPCOMING CONFERENCES

Rachel S. Popelka-Filcoff, Associate Editor

2011

4-7 May. Why Does the Past Matter? Changing Visions, Media and Rationales in the 221st Century. Amherst, MA, USA. General information:

<http://www.umass.edu/chs/news/conference2011.html>

10-12 May. GLASSAC 11-Conference (Glass Science in Art and Conservation) in the Bronnbach Monastery near Wuerzburg, Germany. "Innovative technologies in glass art, design and conservation from the 19th to the 21st century – the role of the sciences" General information:

<http://www.glassac.eu/>

18-22 May. Canadian Archaeological Association Meeting, Halifax, Nova Scotia Alberta, Canada. General information:

<http://novascotiaheritage.ca/caa2011/index.html>. Special session: "Integrating Quarry Data from Outcrop and Extraction to Workshop and Habitation" Session contact: Elizabeth Robertson: liz.robertson@usask.ca

18-20 May. Rocky Mountain (63rd Annual) and Cordilleran (107th Annual) Joint GSA Meeting, Logan, Utah, USA. Special session on Archaeological Geology. General information:

<http://www.geosociety.org/Sections/rm/2011mtg/>

23-26th May. 4th Symposium on Preserving Archaeological Remains in situ (PARIS4). Copenhagen, Denmark. General information:

<http://www.natmus.dk/sw74169.asp>

29 June- 1 July. Archaeometallurgy in Europe III. Bergbau-Museum, Bochum, Germany. General information: <http://www.bergbaumuseum.de/> Contact information: aie3@bergbaumuseum.de

20-27 July. INQUA 2011: Quaternary Sciences-the view from the mountains, Bern, Switzerland. General information: <http://www.inqua.tcd.ie/congress.html>

1-5 August. 60th Annual Denver X-Ray Conference. Colorado Springs, CO, USA. General information: <http://www.dxcicdd.com/>

14-19 August. Goldschmidt 2011. Prague, Czech Republic. General information: <http://www.goldschmidt2011.org/>

28 August-1 September. 242nd National Meeting and Exposition, American Chemical Society. Denver, CO, USA. General information: <http://www.acs.org>.

28-31 August. CANQUA/Canadian Chapter of the International Association of Hydrologists. Quebec City, Canada. General information: <http://www.mun.ca/canqua/index.html>

28-31 August. Geohydro 2011: Water and EARTH: The junction of Quaternary Geoscience and Hydrogeology, Quebec City, Canada. General information: <http://geohydro2011.ca/?q=home>. Abstract deadline: January 24th 2011 Special session: "Exploring Climate Change Impacts on Landscape and Hydrologic Processes at a Range of Spatial and Temporal Scales".

5-8 September. 6th International Congress on the Application of Raman Spectroscopy in Art and Archaeology (RAA 2011). Parma, Italy. General information: <http://www.fis.unipr.it/raa2011/> Abstract deadline March 1 2011

5-8 September. Rustbuckets or floating heritage - corrosion of historic ships. Stockholm, Sweden. General information: <http://www.maritima.se/sv/Verksamheten/Bevarande/Rustbucket-2011/> Contact: rustbuckets2011@maritima.se

5-10 September. Environmental Archaeology of Urban Sites. Gdańsk, Poland. General information: <http://www.archbot.ug.edu.pl/>

14-18 September. 8th International Meeting on Phytolith Research. Estes Park, Colorado, USA. General information: <http://www.Simpr.paleoresearch.com/>

19-23 September. ICOM-CC Triennial Conference. Lisbon, Portugal. General information: <http://www.icom-cc.org/244/triennial-conferences/16th-triennial-conference,-lisbon,-portugal/>

25-30 September. The Clay Minerals Society Annual Meeting. Lake Tahoe, NV, USA. General information: <http://www.clays.org/annual%20meeting/announcement.html>

2-6 October. 38th Federation of Analytical Chemistry and Spectroscopy Societies (FACSS) Meeting. Reno, NV, USA. General information: <http://facss.org/facss/index.php>. Abstract submission January 2011.

9-12 October. The Geological Society of America National Meeting. Minneapolis MN, USA "Archean to

Anthropocene-the past is the key to the future". General information: <http://www.geosociety.org/meetings/>

19-22 October. SWBSS 2011 (Salt Weathering on Buildings and Stone Sculptures), Limassol, Cyprus. General information: <http://www.swbss2011.org/>

21-22 October. Association for Environmental Archaeology: 'Subsistence and surplus production', VU University Amsterdam, Netherlands. General information: <http://www.envarch.net/events/index.html#aea>

25-28 October. Hominid-Carnivore Interactions during the Pleistocene. Tarragona, Spain. General information: <http://hominidcarnivoreinteractions.wordpress.com/>. Abstract deadline February 16 2011.

8-12 November. Inaugural Asia-Pacific Regional Conference on Underwater Cultural Heritage. Manila, Philippines. General information: <http://www.apconf.org/>

13-16 November. 16th Engineering Heritage Australia Conference. Hobart, Tasmania. General information: <http://australia.icomos.org/wp-content/uploads/16th-Engineering-Heritage-Australia-conference.pdf>

16-19 November. 17-20. November. American Schools of Oriental Research Annual Meeting. San Francisco, CA USA. General information: <http://www.asor.org/am/index.html>

16-21 November. American Anthropological Association 110th Annual Meeting. Montreal, QC Canada. General information: <http://www.aaanet.org/meetings/>

17-19 November. Applied Cultural Heritage: How telling the past at historic sites benefits society. Kalmar, Sweden. General information: <http://lnu.se/about-lnu/conferences/international-conference-applied-cultural-heritage-2010?l=en>

25-30 November. The Clay Minerals Society Annual Meeting. Lake Tahoe, NV USA. General information: <http://www.clays.org/annual%20meeting/announcement.html>

1-3 December. Australian Archaeological Association. Toowumba, Queensland, Australia. General information: <http://www.australianarchaeologicalassociation.com.au/conference>

5-9 December. AGU Fall Meeting, San Francisco, CA USA. General information: <http://www.agu.org/meetings/>

2012

5-8 January. 113th Joint AIA/APA Annual Meeting. Philadelphia, PA, USA. General information: <http://www.archaeological.org/webinfo.php?page=10096>

11-15 March. Pittcon Conference and Expo, Orlando, FL, USA. General information: <http://www.pittcon.org/>

25-29 March. 243rd ACS National Meeting and Exposition, San Diego, California, U.S.A. General information: <http://acs.org>

26-30 March. Computer Applications and Quantitative Methods in Archaeology (CAA 2012). University of Southampton, UK. General information: <http://www.southampton.ac.uk/caa2012/>

18-22 April. Society for American Archaeology 77th Annual Meeting. Memphis, TN, USA. General information: <http://www.saa.org/AbouttheSociety/AnnualMeeting/tabid/138/Default.aspx>

28 May- 1 June. International Symposium on Archaeometry. Leuven, Belgium. General information: http://www.ims.demokritos.gr/ISA/ISA_Leuven2012.php?PHPSESSID=28ebbed369e1e459bf20670622390ac3. Contact: Prof. Patrick Degryse (Patrick.Degryse@ees.kuleuven.be)

8-13 July. 8th International Conference Easter Island and the Pacific: Living in Changing Island Environments. Santa Rosa, CA, USA. General information: <http://islandheritage.org/wordpress/>

2-10 August. 34th International Geological Congress. Brisbane, Australia. General information: <http://www.34igc.org/>

20-24 August. 12th International Paleolimnology Symposium, Glasgow, UK. General information: <http://www.paleolim.org/index.php/symposia/>

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