

SAS BULLETIN

NEWSLETTER OF THE SOCIETY FOR ARCHAEOLOGICAL SCIENCES

VOLUME 37 NUMBER 2

SUMMER 2014

METALS FROM THE BRITISH SHIPWRECK DELTEBRE I (1813), CATALONIA, SPAIN: A BRIEF REPORT

By Nicolás C. Ciarlo (nciarlo@yahoo.com.ar)
Graduate Student, National Research Council of Argentina
Winner 2013 Student Research International Travel Award

Historical and archaeological background

In June 1813, after an unsuccessful expedition to liberate the city of Tarragona from the domain of Napoleonic forces, eighteen ships (the historical sources disagree about this number) of a fleet supervised by the Lt. General John Murray, were surprised by strong gales and ran aground in the Ebro delta (Catalonia coast, Spain).

Almost 200 years later, one of these ships was found by local settlers, and has been the subject of archaeological study since 2008 by the Centre for Underwater Archaeology of Catalonia (CASC-MAC). The research conducted so far at the site (Deltebre I) has included the survey and recording of the ship's structure, and the excavation of the cargo located in the area between the stern and the midship section of the vessel (Vivar et al. 2014).

The metal artifacts: specific aims and methods

The main goal of the research on the metal artifacts from the site is to contribute to the knowledge of British metallurgy in the early 19th century, especially regarding maritime craft. This is currently being addressed by: 1) typological and physicochemical characterization of a sample of cargo artifacts from Deltebre I site, the latter by means of light microscopy (LM), scanning electron

microscopy (SEM), and energy dispersive x-ray spectroscopy (EDX) (fig. 1); 2) analysis of technical features of these objects, such as design, alloys, and manufacturing methods; and 3) examination of evidence related to novel technologies.

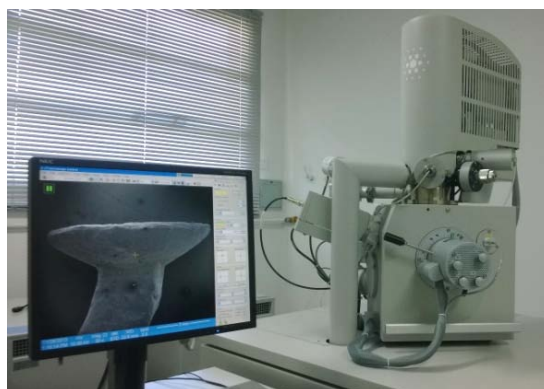


Figure 1. Equipment QUANTA FEG 250 and a SEM image of a sheathing tack's surface from Deltebre I. Photo: courtesy of the National Institute of Industrial Technology.

The initial results of the analyses performed on some of the artifacts recovered are summarized in this brief note. The data obtained from this interdisciplinary research, along with the analysis of historical sources, allows for a detailed examination of technical features such as design, alloys and manufacturing methods used at the early stage of industrialization in England.

A first approach to the cargo

Most of the ship's cargo consisted of ammunition for artillery and personal weapons, as well as other supplies related with their operation. Among the different types of ammo were mortar bombs, grenades, round shots, and canister shots.

Depending on the objectives when challenging an enemy, a wide variety of projectiles could be fired from muzzleloading cannons (Moore 1801; Simmons 1812). For example, canister or case shot created a far reaching, and broad, spray of projectiles, very effective in producing casualties. Each case usually contained a specific number of iron balls, their size and number dependent on the cannon caliber. However, they could also be loaded with objects such as bolts, nails or scrap

IN THIS ISSUE

Announcements	3
Archaeological Ceramics (C.C. Kolb)	4
Archaeometallurgy (T.R. Fenn)	12
Bioarchaeology (K. Meyers)	21
Book Reviews (D. Hill)	
<i>Soils, Climate and Society</i> (W. Eckerle)	22
Remote Sensing and Prospection (A. Sarris)	
<i>Educational Frontiers in Archaeo-geophysical Prospection</i> (Q. Drillat)	23
Upcoming Conferences (R.S. Popelka-Filcoff)	25

(langrage shot). Evidence for the latter, a practice supposedly exclusive to privateers and merchantmen, was found at the site (fig. 2).



Figure 2. An 18-pound canister shot (diameter: ca. 130 mm), filled with different sized balls and a square shank nail (arrow). Photo: by the author.

Concerning hand-held weapons, thousands of lead balls carried on board as cargo were also found. A great number were located in the original containers: barrels and boxes. Some barrels still preserve the inscription of the type of bullets they contained (*Mus^t. Ball*), the number of cartridges (*cartr^s. 500*), and the date of storage (e.g. *Aug^t. 1810*) on their lids (G. Vivar, pers. comm. 2013). Based on the diameters registered, the lead shots from the site are mostly caliber .69, or 29 per two pounds (Muller 1768: 177). These shots were produced by pouring molten lead into molds, a traditional but laborious method that usually left undesirable seams and other imperfections on their surfaces.

In addition to ammunition, almost ten kilos of sheathing tacks were recovered from the stern area of the ship's hold, abaft the mizzen mast. Most of these exhibit traces of the manufacturing process (e.g. burrs and remnants of a sprue on the head perimeter, which indicate they were made by serial casting), and have no signs of being used (fig. 3). They could have been intended to carry out minor repairs on the vessel itself or other ships that were part of the expedition.



Figure 3. Sheathing tacks, with no signs of use: a pair of tacks, as they were extracted from the mold (left), and a tack with remains of the sprue (right). Photo: by the author.

Both sheets and tacks are common remains in shipwrecks from the period, but usually belong to the vessels themselves. Based on the compositional analyses of the

tacks, which cover a time range from 1780 to 1820, there is significant variation in copper-based alloys used by maritime powers during that period (e.g. Samuels 1992: Table 3; MacLeod 1994: 268; Viduka and Ness 2004: Table 2; Ciarlo et al. 2013: 181).

For this work, the application of multivariate statistical analysis allowed for a detailed examination of the manufacturing process to be made and quality standards (e.g. how rigorous the control of the alloy homogeneity among the artifacts was) to be determined. As a whole, the sheathing tacks of analogous morphology seem to have been produced in the same establishment, following certain quality standards. Combining principal components and hierarchical cluster analysis (using Ward's algorithm), the pieces were assembled into three different compositional groups, which are likely indicative of different production batches.

To summarize, the information obtained has contributed to augment the current knowledge about the manufacture of large numbers of artifacts, particularly where traditional means of production persisted within a context of remarkable industrial growth. Additional analyses of this evidence (as well as of other artifacts from the site) are underway, given their potential to provide a more accurate picture of the technological changes that occurred within the British naval arena in the early 19th century.

Acknowledgements

I am deeply grateful to the SAS for honoring me with the *Student International Travel Award*, without which I could not have undertaken this research. I would like to thank Gustau Vivar Lombarte and Rut Geli Mauri, from the host institution (CASC-MAC), for providing me with the opportunity to work with the artifacts from Deltebre I. To my director, Dolores Elkin, for her continuous support, and to Horacio De Rosa (FI-UBA), Gisela Maxia, Nora Schicchi, and Mercedes Pianetti (INTI), for their invaluable assistance with the materials analyses.

References Cited

Ciarlo, N. C., M. C. Lucchetta, & H. De Rosa. 2013. Análisis metalográfico y químico de un conjunto de artefactos recuperados del naufragio *Triunfante* (1756-1795), Golfo de Rosas (Cataluña, España). In X. Nieto et al. (eds.), *El vaixell Triunfante: Una Fita de la Ciència i de la Tècnica del Segle XVIII*. Monografies del CASC N° 10. Catalunya, Spain: Museu d'Arqueologia de Catalunya, pp. 175-188.

MacLeod, I. 1994. Conservation of corroded metals – a study of ships' fastenings from the wreck of HMS *Sirius*. In D. A. Scott et al. (eds.), *Ancient and Historic Metals Conservation and*

Scientific Research. Los Angeles: Getty Conservation Institute, pp. 265-278.

Moore, L. L. 1801. *The British Mariner's Vocabulary*. London: J. Cundee et al.

Muller, J. 1768. *A Treatise of Artillery*. London: John Millan.

Samuels, L. E. 1992. Australia's Contribution to Archaeometallurgy. *Materials Characterisation* 29: 69-109.

Simmons, R. 1812. *The Sea-Gunner Vade-Mecum*. Steel and Co, London.

Viduka, A., & S. Ness. 2004. Analysis of some copper-alloy items from HMAV Bounty wrecked at Pitcairn Island in 1790. *Proceedings of Metal*. Canberra: National Museum of Australia, pp. 265-278.

Vivar, G., R. Geli, & X. Nieto. 2014. Deltebre I. Un barco hundido en la desembocadura del Ebro durante la Guerra del Francés. Proceedings of the *I Congreso de Arqueología Náutica y Subacuática Española*, Museo Nacional de Arqueología Subacuática, Cartagena, Spain. In Press.

ANNOUNCEMENTS

Awards

Congratulations to William Taylor (University of New Mexico), the winner of the 2014 **R. Ervin Taylor Student Poster Award**. William's poster, *Horseback Riding and Equine Cranial Morphology in the Mongolian Bronze Age*, was chosen from many submissions demonstrating innovative contributions to archaeological research through the application of scientific methods. The poster was presented in the session on "Central and Southwest Asia" at this year's Society for American Archaeology's 79th Annual Meeting in Austin, TX. The abstract is as follows:

"The development of horseback riding was fundamentally important to the evolution of pastoral cultures in Eurasia. While early domestic horses may have also been used for load-bearing, meat, and secondary products, equestrianism made rapid, long-distance travel and fully nomadic pastoralism possible. In eastern Asia, linguistic and archaeological evidence suggests that horseback riding may have first been adopted in nomadic societies during the late 2nd millennium B.C. The precise timing and origins of equestrianism in the region, however, remain a matter of continuing debate. New radiocarbon results linked with bridle artifacts, iconography, and other lines of archaeological evidence point to the presence of horseback riding in Mongolia's late Bronze Age "Deer

Stone-Khirigsuur" complex (circa 1300-800 BCE). To test this hypothesis, a sample of 25 horse skulls from late Bronze Age monuments in Mongolia were scanned with a NextEngine 3D scanner and analyzed for both demographic and pathological information. Demographic profiles (inferred from eruption schedules, wear patterns, and crown height measurements) are consistent with expectations for a domestic population. Ossification along the occipital crest, along with newly documented remodeling in the incisive bone, suggest extended periods of exertion and point to human use. Comparison with crania of horses with a known life history supports the archaeological utility of these osteological changes. These results may provide new methodological approaches for investigating equestrianism in the archaeological record."

A PDF version of William's poster can be found at: http://socarchsci.org/poster/WTAYLOR_SAA2014.pdf

Launch of new open access journal *Science and Technology of Archaeological Research (STAR)*

Maney Publishing, one of the world's most prominent publishers of archaeology journals, announces the launch of *Science and Technology of Archaeological Research (STAR)* <http://www.maneyonline.com/loi/sta>, a new journal in archaeological and heritage science, to be published in association with the SAS.

From the press release

(<http://maneypublishing.com/index.php/press-star>):

"In response to the changing needs of archaeology and heritage researchers and practitioners, *STAR* seeks to provide a dynamic, international and high-quality open access forum. Rapid publication of the latest archaeological research resulting from the application of scientific and computational methods is at the core of *STAR*'s remit.

The new electronic journal will demonstrate how the results and relevance of scientific methods aid the understanding of the past. Application of tools and techniques for analysing data will be presented to the broader archaeological community. The editorial team will commission reviews which synthesise the contribution that scientific discoveries and approaches are making to a particular topic. 'Focus issues' will highlight areas of current archaeological debate. A 'Short Reports' section will provide particularly rapid publication of important methodological advances. The full potential of the online format will be used to showcase current methods, with source data accessible as supplementary data or with links to relevant data archives.

As publisher of a significant list of archaeology journals, Maney will work with *STAR* authors to maximise the discoverability of their work and provide them with the tools and resources required to promote their articles to peers.”

STAR will accept papers utilizing any of the array of scientific and computational techniques available to archaeologists, including, but not limited to:

- Scientific dating
- Archaeological materials science, including RAMAN/mass spectrometry
- Environmental and forensic approaches
- Biological and biochemical approaches
- Mathematical modeling and computational analyses
- Airborne remote sensing
- Underwater archaeological methods
- Geophysical, geochronological and GIS
- Spatial analysis and imaging
- Artifact conservation and restoration methods

The journal will also welcome papers in heritage studies and conservation.

STAR is moving towards accepting submissions in summer 2014. If you are interested in submitting a paper, contact the editors: Alan K. Outram (A.K.Outram@exeter.ac.uk) and Robert H. Tykot (rtykot@usf.edu). SAS members receive full waiver of article processing charges as a benefit of their membership.

SAS Board Changes

The SAS board would like to welcome Dawn Janney, the new vice president for membership development. Dawn is taking over from Michael Gregg who has held the position since 2010.

Dawn is a Materials Engineer at Idaho National Laboratory, where her research emphasizes understanding relationships between phases, microstructures, and processing history in complex alloys. Other research interests include developing new applications for solid-state characterization techniques to understand archaeological problems and, more generally, finding new ways to analyze complex data. She holds a B.A. (Honors) in Anthropology from the University of Arizona, a M.S. in Computer Science from the University of North Carolina at Chapel Hill, and a Ph.D. in Geology from UC Berkeley.

Thanks to Michael Gregg for his work on the SAS board, and welcome Dawn!

ARCHAEOLOGICAL CERAMICS

Charles C. Kolb, Associate Editor

This issue contains four topics: 1) Book Reviews on Ceramics; 2) Informational Items; 3) Previous Professional Meetings; and 4) Forthcoming Professional Meetings 2015.

Book Reviews on Ceramics

Encyclopedia of Global Archaeology, 11 volumes, Claire Smith (editor-in-chief), New York: Springer, 2014. cxlvi + 8,013 pp., illustrations, ISBN 978-1-4419-0426-3 (print and online versions), volumes not available separately; ISBN 978-1-4419-0465-2 (eReference, online, version). The price for the combined print and eReference versions is \$7,100 and for the eReference alone, \$5,700. Some online booksellers offer discounts of up to 20% for a print version: \$4,489 instead of \$5,700. Some universities have the electronic version available to qualified users. The editor, Professor Claire Smith, is in the Department of Archaeology, Flinders University, Adelaide, SA, Australia. She received her B.A. with First Class Honours, University Medal, from University of New England, Australia (1990) and the Ph.D. from the University of New England, Australia (1996), with a thesis titled “Situating Style: An Ethno-archaeological Study of Social and Material Context in an Australian Aboriginal Artistic System.” Smith has produced nine books (authored, co-authored and co-edited) and more than 40 refereed articles, in English, Spanish, Catalan and Japanese. A former Fulbright Fellow with the Smithsonian's National Museum of Natural History, she has lectured for brief terms at universities in South Africa and the United States, including a one-year post at Columbia University in New York City. She was twice-elected President of the World Archaeological Congress (2003-08, 2008-13) and in this capacity built global research capacity through establishing the Archaeologists without Borders and Global Libraries Programs and by initiating five new international book series. Additional information is available at <http://www.flinders.edu.au/people/claire.smith>.

Smith is the organizational force behind the innovative *Encyclopedia of Global Archaeology*, which is “designed as a definitive reference work for archaeologists, cultural heritage managers, and the general public. Its major aim is to disseminate global expertise in archaeology.” (p. vii). It was also intended first as an online encyclopedia and secondarily as a print reference work. The continuous updating allowed by an online environment would ensure that the encyclopedia remains a definitive reference work. The work has an international and

interdisciplinary focus, including sections and contributors from whole scope of archaeological study and incorporates integrated online enhancements including color images, video, and full search functions. There are some astonishing numbers associated with the publication: 11 volumes with 8,159 pages, augmented by 2,619 illustrations and 1,828 illustrations in color. This compendium has 1,625 total entries prepared by 1,356 authors, characterized as “leading scholars from around the world.” The invited contributors were able to submit entries in their own language. About 140 entries (300,000+ words) were translated from French, Spanish, Portuguese, German, Italian, Japanese, Turkish and Russian. Many of these entries are by scholars who are publishing in English for the first time. In addition, there are 11,634 cross-references and an additional 200 entries commissioned for the eReference version. Smith oversaw this compendium with the assistance of a Managing editor (Jo Smith) and 65 Section Editors – a multinational assemblage. There was a 29-member International Advisory Board and eight translators. Color images and affiliations of all 103 individuals are included in the Preface to this work. Readers will notes that a number of the entries are written by SAS members, some by Associate Editors of the *Bulletin* or present or past SAS officers. Likewise, some of the Section Editor and International Advisory Board are SAS members.

A few general remarks before this review focuses on ceramic materials. Many of the contributors to the entries on archaeological theory are rightly included from South America and the encyclopedia includes biographical sketches of African, South American, and Russian colleagues, as well as those from Australia. It must have been a difficult task to decide which biographies to include or exclude and readers would likely point out that a particular scholar was excluded. More than 18 entries concern Paleolithic archaeology and related topics but there is some overlap in coverage because boundaries are not defined (Central Asia and the Near East, for example – but better an overlap rather than exclusion); likewise, there is a heavy emphasis on the Near East. Regions not usually covered are included, notably within South America, Sub-Saharan Africa, Oceania, Mongolia, and the northern polar regions, among others. Notably, there is a cluster of entries devoted to Islamic archaeology.

The “Topical Table of Contents” has 30 themes with 1,625 entries in alphabetical order; the themes with the most entries are: Additional Bibliographical Entries (n = 129 separate entries); Cultural Heritage Management (106); Geographical and Cultural Overview Essays (101); World Heritage (100); Classical Archaeology (93); Environmental Archaeology (78); Theory (76); and

Human Evolution/Peopling of the World (71). The complete list of 30 and numbers of entries follows: Additional Bibliographical Entries (n = 129 separate entries); Agriculture and Domestication (85); Archaeological Science (37); Archaeology in the Modern World (27); Archaeology of Art (51); Bioarchaeology and Human Osteology (46); Classical Archaeology (93); Conservation and Preservation (49); Cultural Heritage Management (106); Environmental Archaeology (78); Ethics (29); Extreme Environments (19); Field Archaeology (43); Geographical and Cultural Overview Essays (101); Historical Archaeology (28); History of Archaeology (33); Human Evolution/Peopling of the World (71); Hunter-Gatherer and Mid-Range Societies (29); Indigenous Archaeology (52); Islamic Archaeology (17); Legislation (32); Medieval Archaeology (10); Museums (35); Near East (Ancient, Pre-Achaemenid) (8); Near East (Hellenistic and Roman) (21); Political and Social Archaeology (31); Public Archaeology/Education (18); Theory (76); Underwater and Maritime Archaeology (46); and World Heritage (100).

There are at least 52 contributions wholly devoted to ceramic subjects or that have significant content about ceramics (my apologies if I missed any). These include (in order of entries in the encyclopedia, with authors’ names, titles of the entries, and page numbers): Wells, E. Christian, Archaeological Chemistry: Definition. 131-332; Wells, E. Christian, Archaeometry: Definition. 468-470; Odegaard, Nancy and Vicki Cassman, Authentication and Conservation in Archaeological Science. 702-711; Cleere, Henry, Authenticity in Archaeological Conservation and Preservation. 720-724; Gnade, Marijke and Jeltsje Stobbe, Central Italy: Pre-Roman and Archaic Ceramics. 1247-1258; Orser, Charles E., Jr., Ceramics as Dating Tools in Historical Archaeology. 1291-1292; Kotsonas, Antonis, Ceramics: Ancient Greek. 1292-1303; Crawford, Abigail, Ceramics: Imperial Roman. 1303-1310; Lim, Tse Liang, Ceramics: Southeast Asian and Chinese Trade. 1310-1314; Galke, Laura J., Ceramics: Colonoware. 1314-1315; Odegaard, Nancy, Ceramics: Conservation and Preservation. 1315-1318; Majewski, Teresita, Ceramics: European Cream to Whitewares in the USA. 1318-1321; Pasinski, Tony and Patricia Fournier, Ceramics: Majolica in Colonial Latin America. 1344-1352; Bansucci, Laura, Ceramics: Roman Republican and Early Principate. 1325-1340; Fabbri, Bruno and Sabrina Gualtieri, Ceramics: Scientific Analysis. 1340-1342; Gaimster, David, Ceramics: Stonewares. 1342- 1344; Pasinski, Tony and Patricia Fournier, Ceramics: The Ibero-American Shipping Container. 1344-1352; Canepa, Teresa, Chinese Porcelain: Late Ming (1366-1644) and Qing (1644-1911) Dynasties. 1447-1448; O’Brien, Michael J.,

Chronological Systems: Establishment of. 1460-147; Davey, Peter, Clay Pipes in Historical Archaeology. 1500-1502; Ruiz, Juan Francisco and Marvin W. Rowe, Dating Methods (Absolute and Relative) in Archaeology of Art. 2036-2042; Wesler, Kit W., Dating Methods in Historical Archaeology. 2042-2044; Feathers, James K., Dating Techniques in Archaeological Science. 2044-2053; Joannes-Boyau, Renaud, Electron Spin Resonance (ESR) Dating In Archaeology. 2352-2358; Politis, Gustavo G., Ethnoarchaeology. 2523-2530; Margaris, Amy V., Fourier Transform Infrared Spectroscopy (FTIR): Applications in Archaeology. 2890-2893; Reber, Eleanor A., Gas Chromatography-Mass Spectrometry (GC-MS): Applications in Archaeology. 2953-2959; Hill, Christopher L. and George (Rip) Rapp, Geoarchaeology. 3008-3017; Kolb, Charles C., Glassie III, Henry. 3050-3052; Velasquez S. H., Verónica, Goggin, John M. 3068-3070; Dussubieux, Laure, Inductively Coupled Plasma-Mass Spectrometry (ICP-MS): Applications in Archaeology. 3847-3852; Moffat, Ian, Isotope Geochemistry in Archaeology. 4106-4111; Knappett, Carl, Materiality in Archaeological Theory. 4700-4708; Brown, Duncan H., Medieval Pottery Research Group (MPRG). 4737-4738; Fournier, Patricia and Verónica Velasquez S. H., Mexico: Historical Archaeology. 4850-4863; Pecci, Alessandra, Organic Residue Analysis in Archaeology. 5605-5611; Glascock, Michael D., Neutron Activation Analysis (NAA): Applications in Archaeology. 5239-5247; Kolb, Charles C., Noël Hume, Ivor. 5295-5297; Popelka-Filcoff, Rachel S., Pigment Analysis in Archaeology. 5948-5951; Casimiro, Tânia Manuel, Portuguese Faience and Historical Archaeology. 6037-6044; Casimiro, Tânia Manuel, Portuguese Redwares and Coarse Wares in Historical Archaeology. 6045-6052; Kolb, Charles C., Provenance Studies in Archaeology. 6172-6181; Taylor, R. E., Radiocarbon Dating. 6226-6235; McPhillips, Stephen, Rural Life in Islamic Archaeology. 6385-6398; Frahm, Ellery, Scanning Electron Microscopy (SEM): Applications in Archaeology. 6487-6495; Sternberg, Robert, Society for Archaeological Sciences (SAS). 6768-6770; Skowronek, Russell K., South, Stanley A. 6866-6868; Wisseman, Sarah U., Technological Studies in Archaeological Science. 7246-7253; Lulof, Patricia S., Terracotta Architectural Sculpture in Classical Archaeology. 7273-7278; Nixon, Sam, West Africa: Islamic Archaeology. 7720-7733; Garrison, Ervan, X-Ray Diffraction (XRD): Applications in Archaeology. 7929-7933; and Shackley, M. Steven. X-Ray Fluorescence (XRF): Applications in Archaeology. 7933-7938.

This is certainly the most comprehensive “global” encyclopedia of archaeology that has been published. While the “Topical Table of Contents” lists the 1,625 entries within 30 topics, the encyclopedia entries are

organized alphabetically and I wish that the compendium had a simple alphabetical A-to-Z table of contents: Abu Hureyra to Zvelebil, Marek. The 11,634 cross-references in the online version are especially useful and the links to the other citations load quickly but indirectly (for example, the link to “Altai: Paleolithic” takes the reader to the beginning of the “A” volume and one has to scroll down to the actual entry, pp. 451-458). This encyclopedia claims to encompass the breadth of the subject along with key concepts and aspects that are selected from other disciplines. This vast undertaking includes all time periods and regions of the world and all stages of human development. Nonetheless, readers would likely wish that a particular site or topic had been included. The contributions appear to be up-to-date through mid-2013. This encyclopedia was a Herculean task well accomplished and a credit to the organizers, editors, and translators.

Ceramics in America, Robert Hunter (ed.), Milwaukee, WI: The Chipstone Foundation, distributed by the University Press of New England, Hanover and London, 2013. xiv +286 pp., 230 illustrations. ISBN 978-0-9827722-2-5, ISSN 1533-7154, \$65.00 (hardcover) – available online at lesser cost. Hunter, a fellow of the Society of Antiquaries of London and an archaeologist and ceramic historian, lives in Williamsburg, Virginia. This annual volume, now in its thirteenth year of publication, is regarded as the definitive publication on historical ceramics and contains well-written and edited articles with exquisite color illustrations again rendered by Gavin Ashworth. Hunter provides an “Editorial Statement” (p. vii) and “Introduction” (pp. ix-xvi). The main part of this volume consists of nine essays, detailed below.

Claudia A. Mooney, April L. Hynes, and Mark M. Newell “African American Face Vessels: History and Ritual in 19th-Century Edgefield” (pp. 2-37, 32 figures, 108 endnotes). The production of these face vessels from Edgefield, South Carolina are traced to craftsmen originally coming from the Kongo Kingdom of West Africa transported to North America in 1858. In an extensive literature search, the authors assembled historiographic and ethnographic data and studies of extant specimens of face jars and pitchers and report connections to the slave transport *Wanderer*, as well as African customs. Among these are rituals, magic, spells, and conjuring, and secret coded messages transmitted through drum music and oral traditions, especially folk song. The effects on potters such as Ward Lee are reviewed. There is an extensive discussion of the art of conjuring and the Edgefield vessels, polyritualism and cultural influences from the Bakongo culture. Philip

Wingard "From Baltimore to the South Carolina Backcountry: Thomas Chandler's Influence on 19th-Century Stoneware" (pp. 38-76, 60 figures, 60 endnotes). This report provides additional information on Edgefield vessels by focusing on one individual, Thomas Mitchel Chandler (1810-1854) a porter from Baltimore who became a potter in Edgefield. Background is provided on the Baltimore Stoneware Manufactory which produced salt-glazed inscribed and dated products such as churns. In 1833 Chandler enlisted in the US Army engaged in fighting "Indians" in Alabama, Georgia, and Florida (frontier areas at this time), deserted and began potting in South Carolina. Wingard focuses on Chandlers' Edgefield potting sites, products (storage jars, jugs, flasks, pots, and pans) production marks, the influence of Baltimore potters and Chandler's innovations, including innovations in Flat Ware. Nine face vessels are discussed in detail including glaze color ranges and high firing that approached vitrification.

Barbara H. Magid "Stone-ware of Excellent Quality: Alexandria Manufacture' Part II: The Pottery of B.C. Milburn" (pp. 77-119, 80 figures, 54 endnotes). Part I appeared in *Ceramics in America* 2012:111-145. The Benedict C. Milburn pottery located on Wilkes Street in Alexandria, Virginia operated 1831-1876, producing jars, pots, pitchers, and flower pots. Magid focuses on three period of production: 1841-1847, 1947-1861, and 1865-1876 (the pottery was closed during the US Civil War). Three of his seven sons also became potters. The article focuses changes on makers' and merchants' marks, capacity marks, and cobalt blue salt-glaze decorations: brushed cobalt, incised decoration, slip-trailed cobalt, and undecorated pieces. Handles, rims, and vessel forms of Milburn stoneware vary diachronically and comparisons to other pottery productions are noted. Forms include banks, bowls, butter churns, chamber pots, chimney pots, churns, coolers, cups, flower pots, ink bottles, five types of jars, milk pans, pitchers, spittoons, and storage collars. Thomas C. Folk "Waylande Gregory: Science and Ceramics" (pp. 120-136, 20 figures, 15 endnotes). Folk reports on Gregory (1905-1971), an innovative and prolific American art-deco potter who was the subject of an exhibition at the University of Richmond Museums in Virginia through. His works in ceramics, metal, and glass are noted. His ceramic sculptures (cone 5 firings) are celebrated and his association as advisor to the New York World's Fair of 1939 is documented. Ivor Noël Hume "A Hole in One: or, In Search of Piggy Banks and Christmas Boxes" (pp. 137-157, 28 figures, 30 endnotes). Ivor Noël Hume is a collector of early English money boxes or Christmas boxes (called piggy banks in America) and he discusses these beginning in the 16th century from the viewpoint of production. A significant problem is

identifying the type on the basis of sherds since the boxes were designed to be broken. The forms include pitcher, miter, and button-topped categories. All have pin holes as vents to allow air drying before the coin slots are cut into the leather-hard vessel. Trivets were used in kiln firing and glaze scars provide other production evidence. Specimens from the Netherlands and France are also discussed. Jacqui Pearce "Money Boxes: The London Evidence" (pp. 158-164, 4 figures, 26 endnotes). Pearce examined specimens in the collections of the Museum of London, identifying 556 boxes from 142 sites spanning the period 1140-1850. The corpus contains quantities of lead glazed Surrey-Hampshire Coarse Border Ware boxes (1580-1630); many recovered from excavations at The Theater and The Rose and likely associated with monetary donations for viewing the theatrical productions.

Diana Edwards "English and Continental Delft at Temple Newsam House, Leeds" (165-178, 23 figures, 21 endnotes). Newsam House is a Tudor-Jacobean manor house in Leeds, West Yorkshire, England, built beginning in 1500 and since. The tin-glazed earthenware, Delft, dates 1500-1770. Vessel forms include: Bottles, Porringers, mugs, posset pots, dishes, flower pots, teapots, hand warmers, and wall plaques. Diana Strandling "Bonnin & Morris: Reading between the Lines" (pp. 179-199, 24 figures, 40 endnotes). China proprietors Gousse Bonnin and George Anthony Morris, located in Philadelphia, were in operation 1769-1773. Strandling documents the products carried, effects of the French and Indian War, and clay mineral variations. Kurt C. Russ, Robert Hunter, Oliver Mueller-Heubach, and Marshall Goodman "The Remarkable 19th-Century Stoneware of Virginia's Lower James River Valley" (pp. 200-258, 77 figures, 106 endnotes). Archaeological and historic research was employed in four groups of pottery producers in the Richmond to Petersburg area of Virginia. Potting in the City of Richmond is traced from 1884 and the article focuses on four potteries: Benjamin Duval & Co., John Pools Schermerhorn, David Parr, and Keesee & Parr. For Henrico County: Four Mile-Bailey's Creek area, Richard Randolph, Samuel Frayser, Thomas Amoss and Stephen B. Sweeny, while Samuel Wilson produced four wares. For Charles City, Tree's Point and Wilson's Wharf potters are documented, and for Petersburg and Dunwiddie County, five groups were considered: Lowndes/Ducey, Harwood and Harwood & Turner, Enoch Burnet, and Roland Wilson

The volume also includes five "Book Reviews" (pp. 259-272) edited by Amy Earls. Lastly, a 14-page triple-column "Index" (pp. 273-286) conflates topics, proper nouns and illustrations. The Tables of Contents for

Ceramics in America volumes from 2001 through 2012 are available on line:

<http://www.upne.com/series/CIAS.html>

Material Relations: The Marriage Figurines of Prehispanic Honduras by Julia A. Hendon, Rosemary A. Joyce, and Jeanne Lopiparo. Boulder: University Press of Colorado, 2014. xiv + 200 pp., 72 figures (black-and-white photographs and line drawings, 11 tables, references cited. ISBN 978-1-60732-277-1, \$70.00 (hardcover), \$56.00 (eBook purchase, \$9.00 (30-day eBook rental). Hendon (professor of anthropology at Gettysburg College, Gettysburg, PA); Joyce (anthropology professor and Richard and Rhoda Goldman Distinguished Professor in the Social Sciences, University of California, Berkeley); and Lopiparo (assistant professor of anthropology at Rhodes College, Memphis, TN) are well-known Mesoamerican scholars who collaborated in preparing this volume which focuses on a particular type of ceramic figurine – marriage figurines – double human figures (one male and one female) that represent relations formed through social alliances created in Honduran sites AD 500-1000. The authors examine the production, ritual and ceremonial use, and disposal of marriage figurines from six sites: Campo Dos, Cerro Palenque, Copán, Currusté, Tenampua, and Travesia—and explore their role in rituals and ceremonies, as well as in the forming of social bonds and the celebration of relationships among communities. They point out that this is a “social archaeology” of Honduras and not a culture history. The book has an “Introduction,” seven numbered chapters, an “Epilogue,” 271 “References Cited,” and a six-page double-column “Index” that emphasizes proper nouns rather than topics. In the “Acknowledgments” the authors thank the sites’ original excavators and repositories.

In the “Introduction,” the authors expound on the book’s multiple goals: 1) how analyses drawing on contemporary theories of materiality can enhance our understanding of broad social processes from a dedicated, detailed study of small things and 2) the importance of returning to previously excavated and curated collections to interpret these in conjunction with more recent excavation data. Issues of social equality and inequality are characterized and chronological, geographical, and settlements contextualized from the largest, Copán with 2000, structures, to small villages all of which have ceramic figurines as part of household assemblages.

“Working with Clay: Honduran Figurines Traditions” focuses on the history of Honduran figural ceramic traditions from the Preclassic through the Postclassic-1000 BC to AD 1000 and the handmade and mold-made

figurine traditions. The subsequent chapter, “Copán: Making Kin,” reviews figurine contexts, headdresses and hairstyles, a child burial within a noble family, associated grave goods including Ulúa Polychrome vessels, the significance of broken and unbroken figurines, and ceramic whistles. “Tenampua: Conflict and Competition” characterizes a site with ca. 500 structures, the importance of *Spondylus* shell and ceramic censers for burning incense, and emphasizes a single marriage figurine. The semiotics of Ulúa Polychromes and a proposed reconstruction of social practices are also presented.

In “Campo Dos: Wealth and Influence,” the village site, figurine style and decorations, craft production (pottery and mold-made figurines and whistles, and obsidian blades), and headdresses as status markers are documented. “Currusté: Family and Ancestors” begins with a characterization of the site, its distinct ceramics compared to Ulúa pottery, six figural ceramic censers, figurines and figurine molds, and inferred ceremonial activities are discussed. In the chapter “Travesia: Difference and Identity,” human paired and other figurines (human and animal) are described, differences in garment styles noted, headdresses are related to specific animals, double animals are reported, and daily life reconstructed. Marble vases were also produced in the region. The discussion on “Cerro Palenque: Hosting and Power” characterizes the growth of the site from a small community, craft specialization in *Spondylus* shell ornaments, green marble, mold-made figurines, and ceramic effigies. Community social life is also reconstructed. In the “Epilogue,” the authors discuss differences, identity, hierarchy, and herterarchy in regional society, AD 500-1000, comment on the relatively rare examples of human pairs in ceramic sculpture, material relations, and the concept of agency.

The authors undertook no specialized studies on clays or pigments. Nonetheless, this is an important contribution to ceramic figurine studies, the significance of small artifacts and their analysis, and the use of museum collections. Jim Deetz’s classic work isn’t mentioned: *In Small Things Forgotten: An Archaeology of Early American Life* (New York: Doubleday, 1977; expanded and revised edition New York: Anchor, Doubleday, 1996. Archaeological research in Honduras has been prolific, and among other related works is *Hinterland Households: Rural Agrarian Household Diversity in Northwest Honduras* by John G. Douglass (Boulder: University Press of Colorado, 2002; reviewed in *Material Culture: The Journal of the Pioneer America Society* 35(1):68-70 (Fall 2003).

Informational Items

Two thought, related papers by Andrea M. Berlin (James R. Wiseman Chair in Classical Archaeology, Boston University) and an online dissertation by Jeff Speakman (Director, Center for Applied Isotope Studies, University of Georgia): Andrea M. Berlin (2012) *Artifacts and Applications: Computational Thinking for Archaeologists*, *The CSA Newsletter*, Published by the Center for the Study of Architecture 25(2), September 2012, <http://csanet.org/newsletter/fall12/nlf1201.html> and (2014) The Levantine Ceramics Project. *The CSA Newsletter*, Published by the Center for the Study of Architecture 26(3), January 2014, <http://csanet.org/newsletter/winter14/nlw1401.html>.

Robert J. Speakman (2013) *Mimbres Pottery Production and Distribution*, Unpublished Ph.D. dissertation, Universitat de Barcelona Departament de Prehistòria, Història Antiga i Arqueologia, Programa de Doctorat: Societat i Cultura, Barcelona. xix + 313 pp. https://www.academia.edu/4675092/Mimbres_Pottery_Production_and_Distribution [3600 NAA analyses of pottery and clays from several hundred archaeological sites in Arizona, New Mexico, Texas, and northern Mexico; 35 distinct pottery groups are identified].

Figuring Out the Figurines of the Ancient Near East, Occasional Papers in Coroplastic Studies 1, Stephanie Langin-Hooper (ed.), Association for Coroplastic Studies, 2014, xiii + 65 pp. (paperback), full color, ISBN 978-09915533-1-0. The publication is available in three formats: 1) in print (\$30.00 US, plus applicable tax and shipping at <http://www.lulu.com/shop/stephanie-langin-hooper/figuring-out-the-figurines-of-the-ancient-near-east/paperback/product-21480485.html>); 2) as a free download from the ACoSt website, http://coroplasticstudies.univ-lille3.fr/occasional_papers.html; or 3) in a viewing program, also on the ACoSt website, <http://coroplasticstudies.univ-lille3.fr/fichiers/fichierspdf/flash/occasional/FiguringOut1/index.html>. This is the first volume in the series Occasional Papers in Coroplastic Studies that is designed to provide a forum for the publication of peer-reviewed papers dedicated to coroplastic research. The volume contains four that were delivered at one of the three sessions of the Annual Meeting of the American Schools of Oriental Research (ASOR) either in 2009, 2010, or 2011, entitled “Figuring Out the Figurines of the Ancient Near East” and organized by Langin-Hooper. There is a lengthy introduction by the editor, followed by “The Coroplastics of Transjordan: Forming Techniques and Iconographic Traditions in the Iron Age,” by P. M. Michèle Daviau; “Seeing Double: Viewing and Re-Viewing Judean Pillar Figurines Through Modern Eyes,”

by Erin D. Darby; “Double Face, Multiple Meanings: The Hellenistic Pillar Figurines from Maresha,” by Adi Erlich; and “The Mimesis of a World: The Early and Middle Bronze Clay Figurines from Ebla-Tell Mardikh,” by Marco Ramazzotti.

Previous Professional Meetings

Archaeological Research in the Kurdistan Region of Iraq and the Adjacent Areas organized by the University of Athens and the University of Cambridge, was held in Athens, Greece, 1-3 November 2013. The program and abstracts of the presentations are online: <https://www.dropbox.com/s/rkxaro9px22c833/Program.pdf>. One session dealt with ceramics. “Session III: Ceramic, Artifactual and Ecofactual Analysis” chaired by Georgia Kourtessi-Philippakis (University of Athens) and Maria Grazia Masetti-Rouault (Ecole Pratique des Hautes Etudes, Sorbonne, Paris). Six papers concerned ceramics: Olivier Nieuwenhuys (Leiden University) “Revisiting the Halaf period of Northern Iraq”; Claudia Beuger (Martin-Luther University of Halle-Wittenberg) “The pottery sequence of Tell Nader (Erbil) – reflections on pottery research of the Early Chalcolithic Iraqi Kurdistan”; Valentina Orsi (University of Florence) “Interaction and exchange in the ceramic traditions of the northern Jezirah at the turn of the 3rd millennium BC”; Dorota Ławecka (Warsaw University) “Ninevite V - culture or regional pottery style?”; Stuart Blaylock (Independent Scholar) “The Pottery repertoire of the Garzan Valley, Batman, South-East Turkey, in the Second and First Millennia B.C: Four seasons at Gre Amer Höyük”; and Katia Gavagnin (University of Udine) “The Land of Nineveh Regional Project: continuity and change in the ceramic tradition from the 5th Millennium BC to the Neo-Assyrian period.” One additional presentation was presented in another session: Chikako Watanabe (Osaka Gakuin University) “Philological and scientific analysis of cuneiform tablets housed in Suleimaniyah Museum” (read by Tatsundo Koizum, Waseda University, Tokyo).

The Archaeological Institute of America annual meeting was held in Chicago, Illinois, USA, 2-5 January 2014. One session with seven papers was devoted to ceramics: Session: 4A: Comparative Approaches to Mycenaean Cooking Vessels (Colloquium). Organizer: Debra A. Trusty (Florida State University) and Julie A. Hruby (Darmouth College); Discussant: Michael Galaty (Mississippi State University). Session Papers: “Aeginetan Late Bronze Age and Early Iron Age Cooking Pottery” by Walter Gauß (Austrian Archaeological Institute at Athens), Evangelia Kiriati (Fitch Laboratory, BSA Athens), Michael Lindblom (Uppsala University), Bartłomiej Lis (Polish Academy of Sciences), and Jerolyn

E. Morrison (University of Leicester). “Cooking Vessels at Late Helladic Korakou: Implementing a Multilevel Methodology” by Debra A. Trusty (Florida State University). “Mycenaean Cooking Pots: An Attempt at a Supra-Regional Comparison” by Bartłomiej Lis (Polish Academy of Sciences). “Mycenaean Cooking Vessels from Iklaina” by Cynthia W. Shelmerdine (University of Texas at Austin), and Joann Gulizio (College of Charleston). “Cultural Connections in the Mycenaean Hinterland: Evaluation of the LM I and LM II–III Kitchens at Mochlos, Crete” by Jerolyn E. Morrison (University of Leicester). “Producing and Using Cooking Vessels in the Late Mediterranean Bronze Age: A Comparative Evaluation of Kitchen Wares and Related Practices in Postpalatial Crete, Mainland Greece and their Western Periphery” by Elisabetta Borgna (Università di Udine) and Sara T. Levi (Università di Modena-Reggio Emilia). “Building Understanding Through Hypothesis Testing: Replicating and Using Mycenaean Cooking Vessels” by Julie A. Hruby (Dartmouth College) and Connie Podleski (Oregon College of Art and Craft).

Ten other presentations concerned ceramic topics: “The Consumption of Greek Pottery in Western Europe: A New Theoretical Approach to Imported Goods” by Justin St. P. Walsh (Chapman University); “Uses of Clay Sealings in Archaeological Interpretation: Case Studies from Giza, Egypt” by John S. Nolan (Ancient Egypt Research Associates); “Early Bronze Age III Ovens and Kilns at Seyitömer Mound” by Nazan Unan (Dumlupınar University); “Soumak and the Wavy-Line Style: The Interchange of Textile Designs and Geometric Painted Pottery in Ninth-Century Phrygia” by Samuel Holzman (The University of Pennsylvania); “Alishar Hoyuk and Ceramic Innovation in Prehistoric Anatolia” by Shannon Martino (The Field Museum); “Food, Cooking, and Society Identity: Inter-cultural Households in the Colonial Network of Uruk, Mesopotamia, ca. 3700 B.C.E.: by Gil J. Stein (Oriental Institute, The University of Chicago); “The ‘World’ in a Cup: Diachronic Perspectives on Bronze Age Interaction Networks from the Dining Practices and Ceramic Fabrics of Ayia Irini, Kea” by Jill Hilditch (University of Amsterdam) and Evi Gorogianni (University of Akron); “How to Make an Early Helladic II Tile?: The Evidence from Mitrou in East Lokris” by Kyle A. Jazwa (Florida State University); “A Late Antique Kiln at Coriglia” by Eric Thienes (University of Missouri); “Clay – Creation – Carriage – Consumption. The Chaîne Opératoire in the Eastern Marmarica (NW-Egypt): a Case Study” by Heike Möller (University of Cologne) and Anna-Katharina Rieger (University of Cologne); and “The Terracotta Figurines from Tell Atrib” by Aleksandra Hallmann (The Polish

Centre of Mediterranean Archaeology of the University of Warsaw [PCMA]).

The Society for Historical Archaeology annual meeting was held in Québec City, Québec, Canada, 8-12 January 2014. Two Preconference Workshops were of special interest: a full-day workshop on “French Faïence: Styles, Fabrication, Techniques, and History” hosted by Laetitia Métreaux (CELAT, Laval University), and a half-day workshop, “Principles of Clay Pipe Analysis (Or, What to Do with a Pile of Clay Pipe Fragments)” co-hosted by Barry C. Gaulton (Memorial University) and Françoise Duguay (Laval University). The full program and abstracts are online at <http://sha2014.com/program.html>. Four symposia addressed ceramics. SyM-59A “Investigations in Global Material Culture,” Chair: Tânia Casimiro. Five of 12 papers were on ceramics: Catherine Hawkins – English Border Ware Ceramics in Seventeenth-Century Newfoundland”; Lan ngo thi – Study of the tile decoration from 15th to 18th century in architectural sites in Northern Vietnam”; Martijn Van den Bel – “Historic and Modern Amerindian Ceramic production in French Guiana: The Case of Eva 2”; Melanie Marquis, Mara Kaktins, Ruth Ann Armitage, and Daniel Fraser – “Updated Findings on Mary Washington’s Repaired Ceramics: Results of Mass Spectrometry Analysis and Experimental Archaeology”; and Patrick Garrow – “An Early Twentieth Century Ceramic Assemblage from a Burned House in Northern Georgia.” SyM-39 “Clay Tobacco Pipe Studies: Where Will the 21st Century Bring Us,” Chairs: Françoise Duguay and Barry C. Gaulton. The presentations” Barry C. Gaulton – “Clay pipe research in Newfoundland: What works, what doesn’t and what more can be done?”; Beverly Straube – Finding Robert Cotton: an archaeological biography of the first English tobacco pipemaker in the New World”; Arthur R. Clausnitzer, Jr. – “The Use of Tobacco Pipes in Identifying and Separating Contexts on Smuttynose Island, Maine”; Jessica Rymer – “Of crowns and stars and fleurs-de-lis: Politics and Tobacco Pipes in the colonial Chesapeake”; and Françoise Duguay – And what about French Clay Pipes?”

SyM-67 “Ceramics from French Sites: Current Directions,” Chair: Myriam Arcangeli. The papers: Alban Horry – “Poteriers du quotidien à Lyon (France) aux 16^e -18^e siècles: l’apport des fouilles archéologiques”; Stéphane Piques and Jean-Michel Minovez – “Céramiques de Midi-Pyrénées (France) à l’époque moderne”; Stéphane Piques – “La céramique dans les Pyrénées centrales (France) depuis le XV^e Siècle”; Jean Catalo – “Un lot de céramiques du milieu du XVII^e siècle à Toulouse (France)”; Melanie Johnson

Gervais – “Of beauty and utility in Montreal: Changing patterns in the New France ceramic market”; Sebastien Pauly and Tristan Yvon – “Les céramiques de raffinage du sucre: comparaison des productions caractérisées en Guadeloupe et en métropole”; Claude Coutet and Catherine Losier – “Colonial Guyanese Ceramics: A Comparison Between the Production of Two Pottery Workshops”; Myriam Arcangeli – “Un Canari dans la Cuisine: What Ceramic Cookware Shows about Enslaved Cooks in Colonial Guadeloupe, French West Indies”; Fabienne Ravoire – “Approvisionnement en poterie de terre de deux établissements coloniaux Martiniquais du XVIII^e siècle d’après deux fouilles récentes”; George Avery, Tom Middlebrook, and Morris K. Jackson – “French Colonial Pottery recovered from Recent Excavations in NW Louisiana and Deep East Texas”; Delphine Léouffre – “Fine English ware from the 19th century at the Pointe-à-Callière, Montréal”; and Todd Clements – “Mysterious Polychrome Earthenware at Fortress Louisbourg.”

SyM-76 “Latest Developments on French Ceramics in North America: French Production Sites and Centres,” Chair: Yves Monette. The presentations: Michael Batt – “Post-Medieval earthenware production centres in western Brittany”; Yves Monette, Brad Loewen, Stéphane Piques, Jean-Michel Minovez, and Jean-Michel Lassure – “Garonne Valley coarse earthenware: Characterization of Cox productions, 16th-18th centuries”; Françoise Labaune-Jean – “Late 18th century tin-glazed earthenware factories in Rennes (Brittany, France)”; Paola Calderoni – “The Decaen faïencerie in Harfleur (1802-1821): The rediscovery of a lost production”; Laetitia Metreau and Jean Rosen – “Revising traditional attributions of some French tin-glazed earthenware through archeological data and geochemical compositions of the bodies”; Bruno Fajal – “The Normandy stoneware kilns: elements for a typology (14th-20th century)”; Benedicte Guillot and Elisabeth Lecler-Huby – “A 15th to 19th century housing district in the center of Elbeuf”; Fabienne Ravoire – “Ceramics used in the Paris and Ile aristocratic circles in the seventeenth and eighteenth centuries according to archaeological sources”; and Benedicte Guillot, Elisabeth Lecler-Huby, and Paola Calderoni – “An Exceptional 18th Century Apothecary Furniture Set Found in Evreux Ditches: Ceramics, Glass and Masséot-Abaquesne Faïences.”

Two posters on ceramics were presented: Elisabeth Lecler-Huby – “Seventeenth-Century Ceramics Related to an Enameler’s Workshop in Rouen” and Sarah Hess – “Les céramiques de La Chapelle-des-Pots dans la collection des Musées de Saintes.” Other oral presentations included: Fraser Neiman – “Scales of

production and exchange for Afro-Caribbean wares from slave villages on Nevis and St. Kitts”; Linda Pomper – “A group of late 16th century Chinese porcelains with datable English mounts”; Christina Hodge – “NMV: A Number of Marked Vessels from Colonial Harvard College”; Benjamin Barna – “Japanese porcelain cups from a Hawaiian ranch cabin: alcohol, tea, and the socialization of immigrants”; Katherine Cleek – “A Millennium Platter for the Old Block House: The Potential Interplay of Faith and Material Culture”; Boufassa Sami – “La céramique : élément décoratif sur la façade coloniale de Bejaia (Algérie)”; Alison Bell and Donald Gaylord – “Reading Ceramic Use Wear: A Twist in the Plot”; Rebecca Shepherd – “Going Up the Country: A Comparison of Elite Ceramic Consumption Patterns in Charleston and the Carolina Frontier”; Courtney Cox and Brianna Patterson – “A Study of French Colonial Ceramics at the Louie Blanchette Site (23SC2010)”; John Kelly and Phillip Mendenhall – “An Examination of Mashantucket Pequot Social Activities and Identity Around the Turn of the Nineteenth-Century Through On-Reservation Ceramic Assemblages”; and Meta Janowitz – “Smoking Pipes, St. Tammany, the Masons, and New York City Patronage Jobs.”

The Production of Pottery and Pottery Workshops - Archaeological, Ethnographic and Technological Aspects was the topic of a conference held on 16 January 2014 at Ben-Gurion University of the Negev, Beersheva. This meeting was organized by the Southern District of the Israel Antiquities Authority and the Department of Bible, Archaeology and Ancient Near East, Faculty of Humanities and Social Sciences, Ben-Gurion University of the Negev. The opening presentation was by Daniel Varga, who detailed “2013 excavations in the south of Israel.” There were four sessions. Session I: Daphna Zuckerman – “Pottery industry and workshops (archaeological, ethnographic and technological aspects)”; Gilles Jaures – “Technology of construction and operation of pottery kilns”; Elisheva Kamaisky – “The pottery production process from the burial cave of Peqi’in”; Ianir Milevski – “Production and distribution of pottery during the Early Bronze Age in the southern Levant: Economic patterns of pre-urban and urban societies”; and Nissim Golding – “Trade relations between sites in southern Israel during the Iron Age IB and IIA on the basis of analysis of the ceramic finds from this area.” Session II: David Adan-Bayewitz – “Production of pottery and historical change: the Jerusalem area during the Roman period”; Ron Beeri and Danit Levy – “The Jewish pottery workshop from the Early Roman period at the excavations of Crowne Plaza Hotel – ICC, Jerusalem”; Eli Yannai – “A set of kilns for pottery production at Yavneh”; Amir Gorzalczy –

“Industrial and urban planning in the Early Islamic period: the case of the excavations of Mazliyah near Ramla”; and Walid Atrash and Rachel Bar-Natan - Workshops from the Umayyad period at the center of Beit Shean.” Session III: A panel discussion with scholars and public: Chair: Yigal Israel; Discussants: David Adan-Bayewitz, David Ben-Shlomo, Alon de Groot, and Rachel Bar-Natan. Session IV: Reports on key excavations: Yuval Yekutieli – “The renewed excavations at Tel Erani”; Alexander Fantalkin – “The season of excavations at Ashdod-Yam”; and Yitzhak Paz and Emil Aladjem – “Tel Sheva 2013 – revisiting the history of the Late Chalcolithic settlement and the characteristics of its economy.”

LRCW 5: Fifth International Conference on Late Roman Coarse Wares, Cooking Wares and Amphorae in the Mediterranean: Archaeology and Archaeometry Alexandrie (Egypte), 6-10 avril 2014 [Ve Congrès International sur la Céramique Commune, la Céramique Culinaire et les Amphores de l'Antiquité Tardive en Méditerranée Archéologie et Archéométrie] was held in Alexandria, Egypt in early April. Further information and lists of authors and titles are available online:

[https://www.academia.edu/6290145/LRCW_5_Alexandrie_Egypte_6-](https://www.academia.edu/6290145/LRCW_5_Alexandrie_Egypte_6-10_avril_2014_Ve_Congres_International_sur_la_Ceramique_Commune_la_Ceramique_Culinaire_et_les_Amphores)

[10_avril_2014_Ve_Congres_International_sur_la_Ceramique_Commune_la_Ceramique_Culinaire_et_les_Amphores](https://www.academia.edu/6290145/LRCW_5_Alexandrie_Egypte_6-10_avril_2014_Ve_Congres_International_sur_la_Ceramique_Commune_la_Ceramique_Culinaire_et_les_Amphores)

[de l'Antiquité Tardive en Méditerranée Archéologie et Archéométrie](https://www.academia.edu/6290145/LRCW_5_Alexandrie_Egypte_6-10_avril_2014_Ve_Congres_International_sur_la_Ceramique_Commune_la_Ceramique_Culinaire_et_les_Amphores) The meeting had 2 inaugural papers, 41 oral presentations, and 38 posters. The oral papers are organized into seven sessions: Session 1: Archaeometry and Archaeology (4 papers); Session 2: Regional Context: Egypt (11); Session 3: Regional Context: Eastern Mediterranean (8); Session 4: Regional Context: Eastern Europe and the Balkans (5); Session 5: Regional Context: Italian Peninsula (5); Session 6: Regional Context: Sardinia, Sicily, and Tunisia (4); and Session 7: Regional Context: Iberian Peninsula and Portugal (4). Posters are listed alphabetically by authors' last names.

The Society for American Archaeology 79th annual meeting is scheduled 23-27 April 2014 in Austin, Texas, USA; and the 113th annual meeting of the **American Anthropological Association** will be held 3-7 December 2014 in Washington, DC, USA. Reports on ceramic sessions and poster from these meetings will be published in the subsequent *SAS Bulletin*.

Forthcoming Professional Meeting 2015

Terracottas in the Mediterranean Through Time, “Call for Papers,” 23-25 March 2015, University of Haifa,

Israel. The Zinman Institute of Archaeology and the Department of Art History of the University of Haifa, Israel, invites the submission of papers for the conference “Terracottas in the Mediterranean Through Time,” dedicated to the study of terracotta figurines and related objects in the Mediterranean region from the early periods to late antiquity. The conference will take place at the University of Haifa in Israel, 23-25 March 2015. The conference is under the auspices of the Association for Coroplastic Studies (ACoST). The conference aims to bring together scholars and students who often tackle the same issues as they study clay figurines and related objects from different periods and parts of the Mediterranean region. Scholars who research terracottas of illiterate societies often use anthropological and ethnographical methods, while those studying terracottas of historical periods refer to historical sources and artistic analogies. The various viewpoints and attitudes may enrich and deepen our understanding of terracotta figurines and their role in society. The scope of issues to be discussed at the conference will be wide, and will follow the different stages of the terracottas' lives: First stage- the artisans or coroplasts: aspects of manufacture; typology and iconography; production of large- and small-scale terracottas; social status of the artisans; organization of workshops; questions of specialization; relationships with other media and workshops; new technologies employed in the dating and identification of workshops. Second stage- patterns of distribution: interaction between terracotta production and markets; local production versus imports; imitations; trading, selling and offering. Third stage- the users: Who used terracottas and who did not; how they were used and in what circumstances; usage through space and time; other objects used together with terracottas; themes and types in specific contexts (sacred, funereal and domestic); choice of types; symbolic meaning conveyed by terracottas; the role of terracottas in society; terracottas and gender. Fourth stage - phasing out: How, why and when terracottas went out of use; patterns of deposition or obliteration; archaeological context of terracottas and its meaning. Fifth stage - ancient terracottas today: influence of ancient terracottas on 19th- and 20th-century art; robbery and the antiquities market; museum display of terracottas. The official language of the conference is English. Presentations should not exceed 20 minutes. Abstracts of 200-300 words should be submitted by 30 September 2014 to Dr. Adi Erlich, aerlich@research.haifa.ac.il in Word format including surname, first name, position, affiliation, phone number, email address and title of paper. They invite proposals for panels and individual papers on these and related topics. The scientific committee: Dr. Adi Erlich, Dr. Sonia

Klinger, Prof. Talley Ornan, Consultant: Prof. Jaimee Uhlenbrock.

ARCHAEOMETALLURGY
Thomas R. Fenn, Associate Editor

The column in this issue includes the following categories of information on archaeometallurgy: 1) New Books; 2) Forthcoming Meetings; 3) Previous Meetings; and, 4) Research Opportunities, 5) Obituary.

New Books

Accidental and Experimental Archaeometallurgy, edited by David Dungworth and Roger C. P. Doonan, 2013, HMS Occasional Paper No. 7, The Historical Metallurgy Society, Ltd., United Kingdom, vi+168 p., illus. (many color), ISBN: 0956022510 (pbk.); 9780956022516 (pbk.), £13.00 (UK). This volume contains papers and reports from the HMS meeting in West Dean. Experimental archaeology has acquired a central position amongst the many methods and techniques that have been used to expand our understanding of early metallurgy. Nevertheless, experimental practices remain mysterious to some and poorly disseminated among wider communities. This volume represents an attempt to remedy the paucity of published material and includes many contributions that underscore important theoretical and methodological concerns alongside a number of case studies. Leading figures from across this broad community have come together to provide a coherent publication which details the scope of a number of practices that together are known as experimental archaeometallurgy. Purchase information for this book can be found at: <http://hist-met.org/component/mijoshop/product/32-accidental-and-experimental-archaeometallurgy.html>.

Contributions to the volume include “Experimental archaeometallurgy in perspective” (Roger C. P. Doonan, David Dungworth; pp. 1-100), “Experimental archaeometallurgy: hypothesis testing, happy accidents and theatrical performances” (David Dungworth; pp. 11-16), “Recovering value in experimental studies of ancient metallurgy: a theoretical framework for future studies?” (Roger C. P. Doonan; pp. 17-24), “Twenty-five years of bloomery experiments: perspectives and prospects” (Peter Crew; pp. 25-50), “How to avoid accidents: A critique of archaeometallurgical smelting experiments” (John Merkel; pp. 51-60), “Temperature profiles and cast iron production in experimental iron smelting furnaces” (Gerry McDonnell; pp. 61-68), “An American bloomery in Sussex” (Lee Sauder; pp. 69-74), “Smelting for fun: hypothesis testing, happy accidents and theatrical

performances” (Jake Keen; pp. 75-82), “Experimenting with bowl furnaces” (Brice Girbal; pp. 83-92), “Monstrous fallacies and the assembly of archaeometallurgical experiments” (Roger C. P. Doonan; pp. 93-98), “A report on the Wealden Iron Research Group smelt” (Tim Smith; pp. 99-106), “Making steel in the 'Aristotle furnace’” (Lee Sauder; pp. 107-110), “What have experimental archaeologists done for us? Iron in the East Yorkshire Iron Age” (Peter Halkon; pp. 111-118), “Forging with Dogon smiths (Mali)” (Raphaëlle Soullignac, Vincent Serneels; pp. 119-126), “Does pattern-welding make Anglo-Saxon swords stronger?” (Thomas Birch; pp. 127-134), “From ore to artefact: smelting Alderley Edge copper ores and the casting of a small copper axe” (Simon Timberlake; pp. 135-142), “Small scale reduction of argentiferous galena: first experimental approach to ores assaying techniques” (Joseph Gauthier, Florian Téreygeol; pp. 143-148), “An experimental study of early bronze smithing techniques” (David Dungworth; pp. 149-152), “Exploring metallurgy at Stepnoye: the role of ceramics in the matte conversion process” (Derek Pitman, Roger C. P. Doonan, Bryan Hanks, Dmitry Zdanovich, Elena Kupriyanova, Lente Van Brempt, David Montgomery; pp. 153-160), and “Scientific examination of materials used in the experiments” (Matt Phelps; pp. 161-168).

Mittelalterliche Eisengewinnung im Märkischen Sauerland. Archäometallurgische Untersuchungen zu den Anfängen der Hochofentechnologie in Europa [=Medieval Iron Production in the Märkisches Sauerland. Archaeometallurgical Investigations on the Beginnings of Smelting Furnace Technology in Europe], edited by Albrecht Jockenhövel, 2013, *Münstersche Beiträge zur Ur- und Frühgeschichtlichen Archäologie* Bd. 7, Verlag Marie Leidorf (VML), Rahden/Westf., xii+419 pp, 346 illus, 10 tabs, 21.0 x 29.7 cm, Language: German, with extended English summary, ISBN: 3896462857 (hbk.); 9783896462855 (hbk.), Cost: €79.80.

The book presents the results of a research project conducted by Münster University from 1994 to 2000 and dealing with the emergence of blast furnace technology in Central Europe. It focused on Europe’s largest Medieval iron production area investigated to date and comprising more than 1,500 find sites. By means of excavation, pottery and radiocarbon dating it was possible to distinguish iron production in bloomery type furnaces from the 8th to 13th cent. from iron production in early blast furnaces in the 13th to 18th cent. Bloomery furnaces may be subdivided into sunken hearths with a low shaft and furnaces with a higher shaft and were situated on woody hills. Early blast furnaces were much larger and allowed for a considerable increase of production

capacity under changed working conditions in valleys near surface watercourses. Workshops consisted of working zones including furnaces, post structures, deposits of raw materials, and slag tips. Such industrial landscapes became a favorite motif of Flemish painting from the 16th cent. onwards. Ores were very variable and charcoal was made from up to eleven species of deciduous trees in varying percentages. Innovations were probably owed to high mobility in the Late Middle Ages, but precise areas of origin cannot be determined yet.

The contents of the volume are: 1) Projektansatz und Projektdurchführung (Albrecht Jockenhövel; pp. 1-8); 2) Physiogeografische Voraussetzungen der frühen Eisengewinnung und Eisenverarbeitung im Märkischen Sauerland (Günter Rosenbohm; pp. 9-20); 3) Kierspe-Fernhagen (Märkischer Kreis), Verhüttungsplatz Nr. 11 (Christoph Willms; pp. 21-56); 4) Sieb- und Schlämmanalysen zu Verhüttungsplatz Nr. 11 (Michael Overbeck; pp. 57-66); 5) Kierspe-Wienhagen (Märkischer Kreis), Verhüttungsplatz Nr. 72 (Christoph Willms; pp. 67-90); 6) Sieb- und Schlämmanalysen zu Verhüttungsplatz Nr. 72 (Michael Overbeck; pp. 91-102); 7) Kerspetalsperre (Märkischer Kreis), Verhüttungsplatz Nr. 105 (Michael Overbeck; pp. 103-184); 8) Oberes Wippertal (Oberbergischer Kreis), Verhüttungsplatz Nr. 90 (Thorsten Abdinghoff; pp. 185-250); 9) Archäometallurgische Untersuchungen von Eisenschlacken im Märkischen Sauerland: Die Verhüttungsplätze Nr. 11, 72, 90 und 105 (Ingo Keesmann, Andreas Kronz; pp. 251-264); 10) Chemische Zusammensetzung von archäometallurgischen Eisenschlacken im Märkischen Sauerland (Ingo Keesmann, Zahra Hezarkhani, Andreas Kronz; pp. 265-278); 11) Zur Verhüttung in Rennöfen (Manfried Sönnecken; pp. 279-294); 12) Zur Verhüttung in Floß- und Hochöfen (Hans Ludwig Knau; pp. 295-308); 13) Märkischer Osemund (Hans Ludwig Knau; pp. 309-318); 14) Vom Rennofen zum Hochofen – Technologische Innovationen im Zuge der Entwicklung neuartiger Ofentypen und Verhüttungsverfahren in Mitteleuropa (Albrecht Jockenhövel, Michael Overbeck; pp. 319-360); 15) Schrift- und Bildquellen (Thorsten Abdinghof, Albrecht Jockenhövel; pp. 361-388); 16) Zusammenfassung (Albrecht Jockenhövel, Michael Overbeck; pp. 389-396); Summary [English] (pp. 397-402); and Literatuwerzeichnis (pp. 403-419). More information and purchase price can be found at: <http://www.vml.de/e/detail.php?ISBN=978-3-89646-285-5>.

The Restoration of Ancient Bronzes: Naples and Beyond, edited by Erik Risser and David Saunders, 2013,

J. Paul Getty Museum, Los Angeles, California, 147 p. (book) + 226 p. (gallery), Language: English, ISBN: 9781606061541. The archaeological finds at Herculaneum and Pompeii have rendered Naples an especially rich field for the study of the history of restorations, particularly of ancient bronzes. Bringing together the research of an international group of curators, conservators, archivists, and scientists, this extensively illustrated online volume examines the evolving practice of bronze restoration in Naples and other European centers from the eighteenth century to today.

Presenting the results of new investigations, this collection of essays and case studies addresses the contexts in which the restorations took place, the techniques and materials used, the role of specialists, and changing attitudes to the display of these statues. Along with a rich selection of images, these texts offer a significant contribution to the history of restoration and conservation, providing valuable information regarding the evolution of taste and museum practices at a formative stage of modern archaeology.

The essays collected here were written following a series of presentations at a one-day conference, “Restoring Ancient Bronzes in the Nineteenth Century,” held at the J. Paul Getty Museum on May 6, 2011. Each illustrated essay is accompanied by a separate gallery of large-format images to facilitate study and analysis. Edited by Erik Risser, associate conservator in the Department of Antiquities at the J. Paul Getty Museum, and David Saunders, assistant curator in the Department of Antiquities at the J. Paul Getty Museum, this collection is part of the Getty's ongoing commitment to the online publication of scholarly conferences and symposia.

Contributions to the volume are “Introduction” (Erik Risser, David Saunders; pp. 5-12), “Exhibition and Experiment: A History of the Real Museo Borbonico” (Andrea Milanese; pp. 13-29), “Appearances Can Be Deceiving: The Presentation of Bronzes from Herculaneum and Pompeii” (Carol C. Mattusch; pp. 30-40), “The Restoration History of the Bronze Apollo and Diana from Pompeii” (Erik Risser, David Saunders; pp. 41-56), “The Ephebe from the Via dell'Abbondanza: History of a Restoration” (Luigia Melillo; pp. 57-63), “The Birth and Second Life of the Minerva of Arezzo” (Salvatore Siano; pp. 64-82), “The Child with a Bulla in the Louvre: History of the Reconstruction and Restoration of an Ancient Bronze” (Sophie Descamps-Lequime, Benoît Mille, Dominique Robcis, and Nathalie Balcar; pp. 83-94), “Mounting and Patina: Nineteenth-Century Solutions in the Restoration of Large Bronzes in Berlin's Antikensammlung” (Uwe Peltz; 95-112), “The Bronze

Statue of Trebonianus Gallus in the Metropolitan Museum of Art: Restoration, Technique, and Interpretation” (Seán Hemingway, Sarah McGregor, and Dylan Smith; pp. 113-136), and “Methods and Materials Used for Patination at the Fonderia Chiurazzi” (Luisa Fucito; pp. 137-142). PDFs of the individual contributions can be downloaded at: http://www.getty.edu/museum/symposia/restoring_bronze_s/index.html.

Forthcoming Meetings and Conferences

The international symposium “*Cuivre, laiton, dinanderie mosane : Ateliers et productions métallurgiques à dinant et bouvignes au moyen âge (XIII^e – XVI^e siècles)*” [“*Medieval Copper, Bronze and Brass – History, archaeology and archaeometry of the production of brass, bronze and other copper alloy objects in medieval Europe (12th-16th centuries)*”], will be held from May 15-17, 2014, in Dinant and Namur, Belgium. The finalized program is available for this symposium and includes a number of interesting papers, in both French and English, on various topics in medieval archaeometallurgy divided between four thematic sessions spread over the three days.

Oral presentations within the thematic session entitled *Raw Materials and Supplies* consist of “Trade of metallic products from the Harz Mountains” (Bastian Asmus), “A copper smelter from around year 1300 in Meråker, Norway: A metallurgical interpretation” (Arne Espelund), “Des maîtres du sol aux argentiers : l’exploitation du minerai de cuivre du Midi de la France aux XII^e et XIII^e siècles” (Bernard Lechelon), and “Le poids de l’innovation : le procédé par liquation et ressuage et son impact sur la métallurgie des métaux non-ferreux” (Paul Benoit), while a lone poster in this themed session is “Le combustible associé aux fosses de coulée de cloche médiévales : un marqueur de l’environnement et des pratiques artisanales. Quelques exemples de la région provençale” (Isabelle Gillot, Claire Delhon, Yann Codou, Marc Bouiron, Lise Damotte).

Oral presentations within the thematic sessions entitled *Craftsmen and Workshops* consist of “Evidence of the jewellers' craft and workshops from the Lyudin End in medieval Novgorod” (Natasha Eniosova, L. Pokrovskaya, V. Singh, O. Tarabardina), “Copper artisans in Barcelona (14th to 16th century): between the Arabic tradition and imported products” (Lluïsa Aménos), “Les canonnières-fondeurs des ducs de Bourgogne. Recrutement, implantation et rapports au prince (v. 1450-1493)” (Michael Depreter), “La ville neuve de Middelbourg et ses « marchands bateurs natifs de la ville de dinant ». Un aperçu sur l’organisation socio-économique de l’industrie

de la dinanderie et de ses produits en Flandre entre Moyen Age et à l’Époque Moderne (1466-1578)” (Wim De Clerq, Jan Dumolyn), “A 15th-16th century cannon foundry in Buda (Hungary): Craftsmen and technology of cannon casting in a Royal foundry” (Karoly Belenyesy), “Les artisans des métaux au service de la papauté au XVI^e siècle” (Emmanuel Lamouche), “An archaeometallurgical investigation of a late- to post-medieval foundry in Dubrovnik, Croatia” (Carlotta Gardner, Nikolina Topic, Marcos Martinon-Torres), “The «ex laboratorii Gentili» workshops in Chinzica, Pisa” (Francesco M.P. Carrera), and “Two cannon foundries for bronze pieces found in Lucca and in its province (mid 16th – early 17th century)” (Marco Milanese, Renato Gianni Ridella). Posters presented in this themed session include “Cuivres et laitons mosans : Ateliers et productions métallurgiques à Dinant et Bouvignes au Moyen Âge (XIII^e-XVI^e siècles)” (Nicolas Thomas, Jean Plumier, Marie Verbeek), “Verdun : centre de production de dinanderie mosane au Moyen Âge (XIII^e-XVI^e siècles) ?” (Laurent Vermard, Nicolas Thomas), “La chapelle d’une compagnie de marchands londoniens à la collégiale de Dinant ?” (Marie Verbeek, Carole Hardy), “Les investissements fonciers au XV^e siècle des marchands dinantais et bouvignois de la batterie du cuivre dans la région dinantaise” (Pascal Saint-Amand), “L’implantation du métier des batteurs à Namur (1466-1550). Une intégration réussie ? Un atelier de dinandier du XIII^e siècle à Douai” (Lise Saussus, Etienne Louis), “Les métiers du cuivre à Paris vers 1300 : topographie et étude sociale” (Caroline Bourlet, Nicolas Thomas), “Bell casting activity in medieval Leopoli-Cencelle: technological patterns and socio-cultural implications” (Mainardo Gaudenzi Asinelli), “Bronze as a narrative medium: The Vischer foundry c.1488-1500” (Andrew Keast), “Social life of Saxons in medieval Bosnia and their heritage” (Irfan Teskeredzic), and “L’artisanat du plomb-étain au travers des moules d’objets de pèlerinage au Mont-Saint-Michel aux XIV^e-XV^e siècles (Manche, France)” (Françoise Labeaune-Jean).

Oral presentations within the thematic sessions entitled *Techniques* consist of “Brass hand-basins found in Gotlandic Viking Age tombs - are they of Mosan origin?” (Gustav Trotzig), “The Hildesheim Baptismal Font as a window into medieval workshop practices” (Pete Dandridge), “La production des cloches : spécificités techniques et interactions avec d’autres savoirs. Le cas des ateliers italiens” (Elisabetta Neri, Enrico Giannichedda), “How much did brass cost? An economic perspective of the medieval brass cementation process through experimental simulation” (Nicolas Thomas, David Bourgarit), “Brass or bronze for mediaeval harp strings?” (Paul Dooley), “Sixteenth-century sheet brass for musical

instruments” (Hannes Vereecke), “Italian statuary copper alloys from the 12th to the 16th centuries” (Jean-Marie Welter), “Copper alloy use in sixteenth century northern Italy associated with the workshop of Severo da Ravenna” (Dylan Smith), “Monumental Dinanderie: metal sculpture in the Low Countries” (Lisa Wiersma), “The lasagna technique for casting large 16th century French bronzes: a medieval origin?” (Manon Castelle, David Bourgarit, Francesca G. Bewer), “Les lutrins en laiton dits anglais. L'apport de la technique et des sources littéraires” (Monique De Ruette), and “Brass medieval eagle lecterns in England” (Christopher Green, Roderick Butler). Posters presented in this themed session include “Three innovative processes developed during the 15th and 16th centuries for copper” (Jean-Marie Welter), “Hildesheim treasure: Objects, materials, context” (Dorothe Kemper, Daniel Felenger, Robert Lehman, Carla Vogt, Michael Brandt), “A case of recycling metal? Unusual alloys in a 12th century candlestick” (Catia Viegas Wesolowska), “Casting of a 13th century aquamanile” (Bastian Asmus), “La fabrication des épingles entre les XIIIe et XVIIIe siècles” (Aurore Doridot), and “Archéologie et archéométrie du Bassinia, la fontaine médiévale de Huy (Belgique, province de Liège)” (Nicolas Thomas, Catherine Peters, Françoise Urban, David Bourgarit).

Oral presentations within the thematic sessions entitled *Products and Trade* consist of “The Mosan Aquamanilia and the genesis of the new genre in the 12th century” (Joanna Olchawa), “Bronze on the fringes of Europe: The 12th- and 13th-century Hanseatic bowls in Finland” (Visa Immonem), “Brass, copper and bronze in the medieval Islamic world” (Susan La Niece), “Le cuivre et les alliages cuivreux : circuits commerciaux et usage au quotidien sur le littoral croate des XVe-XVIe siècles” (Florence Fabijanec, Goran Budec), “Medieval reuse of bronze and copper artefacts in western Romania” (Adrian Andrei Rusu), “De la vaisselle métallique à la vaisselle en terre cuite. Exemples de filiation technique entre la Méditerranée et l'Europe du nord du Moyen Âge à la Renaissance” (Catherine Richarte, Sophie Challe, Fabienne Ravoire), “L'utilisation des alliages cuivreux dans les mécanismes de serrure et de cadenas entre le IXe siècle et le XVIe siècle” (Mathieu Linlaud), and “Copper alloy tombs in medieval Europe: image and identity” (Sophie Oosterwijk). Posters presented in this themed session include “Les marchés de la batterie mosane (XIIIe-XVIe siècles)” (Jean-Marie Yante), “Engraving examples of life: the Romanesque bronze bowls from Vercelli” (Silvia Faccin), “L'utilisation des alliages cuivreux dans les mécanismes de serrure et de cadenas entre le IXe siècle et le XVIe siècle” (Mathieu Linlaud), “The so-called Magdeburg bronze doors of the church of

St. Sophia Cathedral in Novgorod the Great” (Lech Koscielak), “Le dynamisme actuel de la recherche sur les stylets à écrire médiévaux” (Jeremie Gnaedig), and “Les XIIe et XIIIe siècles, un tournant dans l'évolution des accessoires du costume : apports de l'étude chronotypologique des objets métalliques en Provence” (Olivier Thuaudet).

Also included at the end of the first day of the symposium is a visit to the exhibition: *L'or des dinandiers*, held at the Maison du patrimoine médiéval mosan, Dinant, Belgium (<http://www.mppmm.be/>). More information on the conference, including PDF files of the program, can be found at: http://dgo4.spw.wallonie.be/DGATLP/Colloque/2014_Laitons_mosans/EN/.

The *International Symposium on Archaeometry (ISA)* will be held from May 19-23, 2014, at the Getty Conservation Institute (GCI) and the University of California Los Angeles (UCLA), both in Los Angeles, California. The preliminary program is now available, for both oral and poster presentations, and can be found at: <http://www.archaeometry2014.com/program/>.

Contributions to the oral session on *Metals and Metallurgical Ceramics*, include “Aspects on the introduction of tin in the Aegean during the 2nd millennium BC” (Yannis Bassiakos), “Archaeometallurgy of Metal Finds from the Medieval “Royal” Burials of Durbi Takusheyi, Northern Nigeria” (Thomas Fenn), “Metal and Elites in Upper Mesopotamia - Uniqueness or Uniformity?” (Kristina A. Franke), “Outside the gates – Metalworking around medieval and postmedieval Copenhagen” (Arne Jouttijärvi), “ICP-AES Analysis of Bronze age based Copper Artefacts from the West of France: The specific chemical signatures of hoards as a function of the region and the typo-chronology” (Cécile Le Carlier de Veslud), “Iron and the Khmer Empire, Cambodia (9th to 15th c.): first study on the sourcing and dating of iron construction materials of Angkor” (Stéphanie Leroy), “Goldsmiths or Wax Sculptors? Individual Skill and Social Agency in Muisca metalwork (Colombia, AD 600-1800)” (Marcos Martinon-Torres), “How To Cook your Met(al): Reconstructing The World's Earliest Metallurgy” (Miljana Radivojevic), “Copper production at El Coyote Honduras: The first evidence for copper smelting in Central America” (Aaron Shugar), “Heaps and Heaps of it: Analysis of Kushan-Sassanid Metallurgical Remains from Mes Aynak, Eastern Afghanistan” (Tom Eley), “Study on the Smelting and Casting Technology of Copper and Copper Alloy Wares from Central Plains in the Early Bronze Age of China” (Yu Liu), “Physical Barriers, Cultural

Connections: Ancient Metallurgy Across the Alpine Region” (Laura Perucchetti), and “Elemental and Lead Isotopic Data of Copper Finds from the Singen Cemetery, Germany – a Methodological Approach to Investigate Early Bronze Age Trade Networks” (Igor Maria Villa).

Contributions to the poster session on *Metals and Metallurgical Ceramics*, include “Iron Age Metallurgy of Jerusalem” (Brett Kaufman), “The Weeping Sakyamuni” (John Twilley), “On the Distribution of European Copper Artifacts in Northeastern North America” (Ron Hancock), “Dacian Gold Artifacts Authentication Using Geological and Metallurgical Arguments” (Daniela Stan), “From sculptures to foundries: elemental compositional analysis to trace modern bronzes provenance” (Monica Ganio), “Persian Crucible Steel Production: Chāhak Tradition” (Rahil Alipour), “Bypyramidal Iron Bars in Eastern France: Metallographic, dating and provenance study” (Sylvain Bauvais), “Experimental and Analytical Investigation of Black Bronze Alloys” (Agnese Benzonelli), “Analytical Study of Andean Precolombian Metallurgy by Energy Dispersive X-Ray Fluorescence” (Jorge A. Bravo), “Metal and Glass Composition of Roman Enamelled Brooches in Gallia Belgica and Germania Inferior” (Maxime Callewaert), “Copper Supply during the Late Neolithic and Bell Beaker from the Pyrénées to the Alps” (Florence Cattin), “Low Tin Bronze Corrosion by Hydrosulfide (HS-) and Sulfide (S₂-) Ions” (Michelle Chan), “Gold in Palaepaphos (Cyprus): A Study of Artifacts from the Early Iron Age Necropolis of Skales using Portable X-Ray Fluorescence Spectrometry (pXRF)” (Andreas Charalambous), “Evidence of arsenical copper smelting of Bronze Age China: a preliminary study of slag discovered at the Laoniupo Site, Central Shaanxi” (Kunlong Chen), “New Insights to the Early 19th-Century Naval Technology: Metallurgical Examination of the Cargo of a British Transport Lost Off Catalonia Coast, Spain” (Nicolás C. Ciarlo), “Breaking Fad: Pushing the Boundaries of Metallurgical Communities at the Cenote Sagrado” (Bryan Cockrell), “Thracian Silver Artifacts from Romanian and USA Museums – the Same Provenance Workshop” (Bogdan Constantinescu), “Neutron diffraction characterization of pre-Roman coinage from northern Italy: silver debasement and relationships within different emissions” (Jacopo Corsi), “Iron Reinforcements on the Mutte Tower, Metz (France): Data Mining and Predictive Analyses Used for Provenancing and Ironmaking Processes Discrimination” (Alexandre Disser), “Comparison Between Quantitative (ICP-OES) and Qualitative (pXRF) Data of Iron Slag from Sagalassos (SW-Turkey)” (Kim Eekelers), “Methodological development for the decomposition of ancient iron slag for ICP-OES analysis” (Kim Eekelers),

“Mill scale on historic wrought iron: characterisation and impact on corrosion behaviour” (Nicola Emmerson), “Gilded and Silvered Artefacts from Medieval Tuscia (Italy): Materials and Technological Features” (Mainardo Gaudenzi Asinelli), “In the middle of it all: metallurgy in Early Bronze Age Palamari (Skyros island, Aegean)” (Myrto Georgakopoulou), “The Importance of Kestel in Anatolian Metal Supply” (Philly Howarth), “Exploitation of Manganese-Rich ‘Ore’ to Smelt Iron in Mwenge, Western Uganda” (Louise Iles), “The metallographic and lead isotopic research on several bronze weapons corresponding to origination of Qin Dynasty” (Lajiang Jia), “Archaeometallurgy in religious textiles” (Ingrid Jimenez), “The role of brass, and its use as surface plating of copper alloys.” (Arne Jouttijärvi), “Counting hammerscale” (Arne Jouttijärvi), “Biringuccio-style casting, hessian crucibles and alchemy” (Arne Jouttijärvi), “Combined XRD, Metallography and Radiography Analysis of Metal and Corrosion Products for Luristan Bronzes, Iran” (Zahra Karamad), “Han Dynasty metal production in Southeastern China: copper smelting and bloomery iron” (David Larreina), “A Scientific Study of Copper Smelting Slag from Yujialing Site in Central China” (Jianxi Li), “Comparative study of furnace material used for cast iron smelting and melting in ancient China” (Haifeng Liu), “Revisiting Free Silica Slag” (Siran Liu), “Crucible or Furnace-A comparative study of silver production traditions in north and south China” (Siran Liu), “Chavin Culture Metal Vessel: Determination of Elemental Composition and Thickness of Multilayer by Portable Energy Dispersive X-Ray Fluorescence (pXRF)” (Fabio Lopes), “Chemistry and Mineralogy of Slags from the Three-Stage Iron and Steel Production Process from the Southern Highlands of Tanzania” (Edwinus Chrisantus Lyaya), “Primary Results of the Technical Study of the Metal Items from Big Kurgan of Ananauri” (Zurab Makharadze), “Metals and Alloys from the San Pedro de Atacama Region, Northern Chile: A Multi-Approach Perspective” (Blanca Maldonado), “Metal workshops of Ancient Egypt: the Case of Ayn el-Sukhna” (Ahmed Mansour), “Perspectives for Isotopic Analysis of Copper Alloys: the case of the Late Bronze Age city of Nuzi” (Elisa Maupas), “Advance results of archeometry investigations about a treasure from Bodrogolaszi, Hungary” (Zsolt Dezső Nagy), “Ready, Aim, Fire! The applicability of hand held portable XRF to the characterization of heterogeneous archaeological metals” (Matthew Nicholas), “Metal Rivets in Norse Antler Comb Manufacture at Bornais, South Uist, Western Isles of Scotland” (Eric Nordgren), “An Unusual Example of Gold Cloisonné from Central Anatolia” (Alice Boccia Paterakis), “Characterization of Two Ophicleides Found at a Chapel in San Juan Tepemasalco, Mexico” (Gabriela

Penuelas-Guerrero), “Metallurgical Traditions Under Inka Rule” (María Teresa Plaza), “Methodological Issues in Understanding Ancient Crucible Metallurgy” (Frederik Rademakers), “Silver in Dnieper Hoards of the 6th-7th c.: First Results of the Analytical Study of the Metal from the Sudzha-Zamoste Hoard” (Irina Saprykina), “Sorting metal objects by XRF tests: Metal finds from Nahariyya Excavations” (Kamil Sari), “Archaeometallurgical Fieldwork and the Use of a Portable X-ray Fluorescence Spectrometer: Revisited” (Rebecca Scott), “The mystery of the lead disc: accidental survival or ritual deposition?” (Rebecca Scott), “pXRF ‘In-the-Field’ Fluctuations” (Rebecca Scott), “Copper Smelting Technologies at Nahal ‘Amram, Southwest ‘Araba Valley, Israel” (Sana Shilstein), “Metal Objects in the Paolo Orsi Museum (Siracusa, Italy): Non-Destructive Compositional Analysis” (Robert H. Tykot), “Metal Production at the Late Bronze Age Site of Kalavassos-Ayios Dhimitrios, Cyprus” (Lente Van Brempt), “Iron on the Angkorian Frontier: Evidence from Iron Smelting Sites in Laos and Thailand” (Pira Venunan), “A Preliminary Study on a Bronze Incense Burner Dated to the Eastern Jin Dynasty (317-420 a.D.) in Nanjing City, China” (Xiaoqi Wang), “The Wiener Neustadt Hoard – Material Analysis and Clarification of the Excavation Site” (Rita Wiesinger), “Research on gold and silver gilding technology on copper wares of Han Dynasty excavated from the Three Gorges” (Xiaogang Yang), “Metallographical, Elemental and Lead-isotopic Study on Bronze vessels of Early Western Zhou Dynasty from Noble Tomb No.511 in Luoyang” (Xiaohong Yuan), and “Preliminary Investigation of the Sri Lankan Copper-alloy Statues” (Kasthuri).

The *Fourth Balkan Symposium on Archaeometry* will be held September 27 – 30, 2014, in Nessebar, Bulgaria. The *Balkan Symposium on Archaeometry (BSA)* is a biennial meeting, the first being held in Ohrid, Republic of Macedonia in 2008, the second – in Istanbul, Turkey in 2010 and the third – in Bucharest, Romania in 2012. Organizers of the symposium are the Institute of Solid State Physics and the National Institute of Archaeology with Museum of the Bulgarian Academy of Sciences. Co-organizers are Sofia University “St. Kliment Ohridski” and Museum “Ancient Nessebar”. The symposium will be focused on many aspects of archaeometry, the application of modern experimental methods and techniques used in dating, investigation and identification of ancient artifacts, as well as related fields of archaeology and art history. The symposium program will include invited lectures, oral and poster presentations on various topics including a theme of archaeometallurgy.

The 4th BSA meeting will be organized across 4 days: a 3-day conference presenting sessions (invited, oral and poster presentations) and a one-day workshop. At the workshop the participants will see demonstrations and will participate in experiments *in situ* with portable apparatus at real archaeological sites or in museum rooms. In addition to scientific seminars, a wide range of social programs including city tours and visits to historical places will be available. The Organizing Committee also encourages companies and institutions to showcase their modern products and equipment in the conference area. A limited number of grants will be available for young scientists and PhD students in order to partly support their participation. Candidates must be registered for the conference and have submitted their abstracts. The Program committee will announce the approval of the abstracts until June 15, 2014. Grant applicants need to submit, by May 30, 2014:

- Curriculum Vitae
- Motivation letter. Please specify the kind of support that you may need
- Registration form and submitted abstract
- Students have to give evidence of University registration

The organizing committee will contact the beneficiaries by June 20, 2014, at the latest.

Other conference deadlines consist of:

- Abstract submission deadline: **May 30, 2014**
- Deadline for applying for grants: **May 30, 2014**
- Deadline for early registration: **June 30, 2014**

More information about the conference, registration, venue, program, etc., can be found at the website: <http://bsa4.issp.bas.bg/>.

Previous Meetings and Conferences

The *X Congreso Ibérico de Arqueometría 2013* was held at Museo de Bellas Artes de Castellón, Spain, from October 16-18, 2013. Initially called the National Congress of Archaeometry, it was conceived from the start to occur on a biennial basis and to promote a forum for discussion and meeting for national research groups dedicated to the characterization of cultural heritage materials using different analytical techniques, such as from the areas of physics and chemistry. The morning of the last day of the congress was dedicated to a session entitled “Analysis of Materials: Metals”, moderated by Dr. Salvador Rovira Llorens. Oral contributions to this session included “Caracterización de una pieza de hojalata proveniente del sitio arqueológico Posta El Caldén, finales del siglo XIX (La Pampa, Argentina)” (F. Caretti, E. Montanari, H. de Rosa, C. Landa), “Plomo

metálico en yacimientos de la I Edad del Hierro en la Provincia de Castellón: Explotación de recursos mineros y circulación del metal” (I. Montero-Ruiz, G. Aguilera, C. Rovira-Ortolá), “Caracterización no destructiva de piezas arqueológicas metalúrgicas del siglo XIII (Excavación del castillo de Ereñozar) mediante fluorescencia de Rayos-X” (M. Veneranda, J. Aramendia, S. Fdez-Ortiz de Vallejuelo, L. García, M. Neira, K. Castro, I. García, A. Azkarate, J. M. Madariaga), “Estudio comparado de dos navíos franceses de la Batalla de Trafalgar: los elementos de fijación estructurales del Fougueux (1785-1805) y Bucentaure (1804-1805)” (N. Ciarlo, M. Rañi, H. de Rosa, M. C. Luchetta, P. Marino, N. Rodríguez, J. Martí), “Objetos metálicos de base cobre del yacimiento de Cueva Pintada (Gáldar, Gran Canaria)” (C. Gutiérrez, M. Gener, M. C. González, I. Montero-Ruiz, J. Onrubia, J. I. Sáenz), “Análisis arqueométrico y restauración de un conjunto de hebillas del yacimiento “Ermita Vieja de la Torre” ” (P. C. Gutiérrez-Neira, A. I. Pardo, M^a C. Medina, A. Climent-Font, J. Barrio), “Análisis y estudios de dorados en retablos de la Mixteca Alta. Estudio preliminar en obras del s. XVIII en las comunidades Yolomecatl, Cuquila y Tataltepec” (V. Santos Vasquez, L. Huidobro Salas), “Estudio tecnológico y arqueométrico de las joyas procedentes de las tumbas fenicias de la Avenida de Andalucía, Cádiz: primeros resultados” (A. Perea, S. Domínguez-Bella, R. Belinzón, M. E. García), “La metalurgia argárica: nuevas aportaciones. Los yacimientos de Castellón Alto (Galera) y La Terrera del Reloj (Dehesas de Guadix)” (C. Bashore, A. Moreno, F. Contreras), and “Análisis de monedas del siglo III a.C. en la Península Ibérica mediante un equipo portátil de fluorescencia de rayos X” (B. Gómez-Tubío, A. I. Moreno-Suarez, M. Á. Respaldiza, F. Chaves, R. Pliego, I. Ortega-Feliu, F. J. Ager, S. Scrivano). Contributions to the poster portion of this session included “El Archivo Au: acceso público y puesta en valor” (P. C. Gutiérrez-Neira, O. García-Vuelta, A. Perea), “Una aproximación a la tecnología metalúrgica postalayótica a través del estudio de los tintinabula” (L. Perelló Mateo, B. Llull Estarellas), “Observaciones sobre un caso de producción artesanal en serie: análisis metalúrgico de las tachas de revestimiento de forro halladas en el sitio Deltebre (1813)” (Nicolás C. Ciarlo, Marina Rañi, Horacio M. De Rosa, Gisela Maxia, Rut Geli Mauri y Gustau Vivar Lombarte), “Estudio preliminar de la metalurgia del plomo y la plata en la ciudad Fenicia de Baria” (S. Carpintero Lozano), and “Análisis de artefactos de metal provenientes del sitio arqueológico Vuelta de Obligado, Provincia de Buenos Aires, Argentina” (Horacio De Rosa, Mariano Ramos, Ariel Lopez, Verónica Helfer, Matilde Lanza, Alejandra Raies, Marina Rañi). More information about the

congress, and access to PDF versions of the program, including abstracts, can be found at the congress website: <https://sites.google.com/site/arqueometria2013/>, and at the website of the Institut Valencià de Conservació i Restauració de Béns Culturals: <http://www.ivcr.es/ivcr.php?area=congresos>.

The *Society for American Archaeology* held its annual meeting April 23-27, 2014, in Austin, Texas. There were a handful of presentations and posters at the conference of archaeometallurgical interest. These included “Identifying American native and European smelted coppers with pXRF: a case study of artifacts from the Upper Great Lakes region” (Heather Walder, Laure Dussubieux), “Copper Bells in the Southwest: Evaluating the Prestige Goods Model” (Ian Boyce), “Late Bronze Age (1900-1500 BC) Copper metallurgy and interactions between sedentary and mobile groups in Southern Uzbekistan” (Yuqi Li), “Outdoor Miners: The Last Day of Work at a Medieval Copper Producing Village in Southern Jordan” (Ian Jones, Mohammad Najjar, Thomas Levy), “Research on the Copper Producing Area at El Coyote, Sta Barbara, Honduras” (Edward Schortman, Patricia Urban), “Experimental replication of copper production at the Gulkana Site, Alaska” (Elizabeth Carroll), “Metal Tools in Lacandon Maya Economics” (Joel Palka), “Population dynamics and the flow of knowledge and substances: a new perspective on flint mining and the earliest metallurgy in Neolithic Europe” (Tim Kerig), “Remembrance of Things Cast (and/or Hammered): Depositions of Metal Objects at the Cenote Sagrado, Chichén Itzá” (Bryan Cockrell, José Luis Ruvalcaba Sil, Edith Ortiz Díaz), “Moving North: Metallurgy in West and Northwest Mesoamerica during the Postclassic (AD 900-1450)” (Jose Luis Punzo), “Chlorine determination in iron artifacts by prompt gamma activation analysis (PGAA)” (Ursel Wagner, Rupert Gebhard, Zsolt Revay, Peter Albert, Friedrich E. Wagner), “Interpreting Workshop Food Supply from Faunal Assemblages and the Production Organization of Iron Industry during the Han Era: An Example from Taicheng Iron Foundry” (Weng Cheong Lam, Jianrong Cong, Xingshan Lei), “Characterization of some pre-Columbian gold wires from South America” (Sebastian Warmlander, Vanessa Muros, David Scott), “Precolumbian Mining in the Atacama Region of Northern Chile: Present Knowledge and Future Research” (Blanca Maldonado, Diego Salazar, Thilo Rehren), “Hematite mining and ritual in ancient Peru” (Marcela Poirier, Hendrik Van Gijseghem, Kevin Vaughn), “The Afterlife of Industrial Landscapes: Strategies for Cultural Heritage Management of Ancient and Historical Mining Sites in Spain and Beyond” (Linda Gosner), and “Fragmented Production, Fractured Power: An

Examination of the Colonial Mining Landscape in Huancavelica” (Douglas Smit, Antonio Coello Rodriguez). The program and abstracts can be found at: <http://www.saa.org/AbouttheSociety/AnnualMeeting/2014Program/tabid/1508/Default.aspx>.

Research Opportunities

The *Deutsches Archäologisches Institut (DAI)*, or **German Archaeological Institute**, currently is offering **two positions** as Scientific Assistant in the Eurasia Department, to be filled as soon as possible, and to be occupied until 12/31/14. The place of employment is Berlin. Subject to the professional competence evaluation and available resources, it may be possible to get an extension of the position beyond 12/31/14. The DAI is a “scientific corporation” of the Federal Institute operating under the auspices of the Foreign Office, and conducts research in the field of archeology and its related disciplines. With 15 branch offices in Germany and abroad, the DAI is the largest research institute in the field of archeology and classical studies in the Federal Republic of Germany. The duties for the Scientific Assistant include participation in the project “*Ancient Mines in Afghanistan*.” These include scientific support to the project management, collection of specimens, data entry and scientific evaluation and communication with the project partners in Germany and Kabul.

Prerequisite for employment is a completed Bachelor/Master diploma university degree in Prehistoric Archaeology and Near Eastern Archaeology. The degree must not have been received more than six years ago. Applicants must not have a doctorate degree. Applicants already working on a dissertation will need to provide a detailed research concept. Proficiency in English is required. Experience in data collection is an advantage.

The weekly working hours for graduate assistants is, in accordance with the guidelines on the employment of research assistants at the DAI, 18.5 hours. The workstation supports scientific training, and preferably for the completion of the dissertation also on the regular weekly working hours available. According to the guidelines on the employment, research assistants (at the DAI (with university degree, Master Diploma) receive a gross remuneration of €1,250. Applications including CV, certificates, list of publications and details of previous professional activities should be sent to the following address:

Deutsches Archäologisches Institut
Direktor der Eurasien-Abteilung
Herrn Prof. Dr. Svend Hansen
Kennziffer: 19/2014
Im Dol 2-6
14195 Berlin

For more information contact: Frau Korpus, Tel.: 030-187711-161, E-Mail: personal@dainst.de. For the advertisement and general information about the DAI see: <http://www.dainst.org/en/> or <http://www.dainst.org/en/position-offered/wissenschaftliche-hilfskraft-der-eurasien-abteilung?ft=all>.

Obituary



Photo:

<http://oxalid.arch.ox.ac.uk/Isotrace%20laboratory/Isotrace%20laboratory.htm>

Noël Harold Gale, MA, DSc, PhD, BSc, ARCS, FSA
Emeritus Professor of the University of Oxford
Fellow of Nuffield College, Oxford.

24 December 1931 – 3 February 2014

It is with great sadness that we announce the death of Noël Gale, an academic who for many years in his research in Oxford strived to straddle the Two Cultures of Science and Humanities.

Noël was a star pupil of Brockenhurst Grammar School and graduated in Physics from Imperial College, London. He started his PhD degree in St. Bartholomew’s Hospital, London, on application of nuclear physics to medicine, but then changed to a pure physics degree which he completed at the University of Manchester. Still as a nuclear physicist he worked for several years at the Harwell Laboratory of the Atomic Energy Research Establishment until the early 1960s when he was employed by the University of Oxford in the Department of Geology (later Department of Earth Sciences) to build one of the earliest mass spectrometers to be used in isotope geochronology.

His work in the Age Laboratory of this department led in 1975 to a meeting with Prof. Wolfgang Gentner of Heidelberg University who proposed that they collaborate

on developing the use of lead isotope analysis in revealing the origin of ancient silver Greek coinage. Soon afterwards Professor Colin Renfrew suggested to Noël that a really interesting project would be to investigate Bronze Age sources of lead and silver in the Aegean. Over the course of the next thirty years, at the University of Oxford, Noël Gale became a leading scientist in the field of application of lead isotope analyses in provenance studies of Bronze Age metals in the Mediterranean. Thanks to his total devotion to this subject and his uncompromising scientific integrity he raised this technique to a status amongst the archaeologists similar to that of Carbon-14 dating. Subsequent controversy over this method of provenancing ancient metals helped to refine the interpretation methodology and kept it on strong scientific grounds. His contribution to science based archaeology should not be underestimated.

(obituary by Zofia Stos-Gale)

On a personal note, I had the great opportunity to get to know Noël over the past decade and a half. He was always a gentleman and a consummate scholar. I enjoyed many a good meal and conversation with him at various meetings, symposia and conferences. It was Noël (and Zofia also) who first inspired me to study lead isotope analyses as part of my interests in ancient metallurgy and provenance studies. He will be missed.

BIOARCHAEOLOGY

Katy Meyers, Associate Editor

The New Questions of Stable Isotope Analysis

Stable isotope analysis for me has always been a little too simple- if we find high ratios of Carbon 13 the people were eating more C4 plants, and if we find low Nitrogen 15 ratios they were primarily vegetarians. This type of simplistic correlation has always left me feeling slightly skeptical. That is why I'm excited by the new stable isotope analysis studies of human remains- not only are they using a wide range of evidence to add to their argument, but they're questioning the outcomes of the ratios. The two articles I want to feature here are Fenner, Tumen and Khatanbaatar (2014), and Touzeau et al. (2014). While they both use stable isotopes to analyze human remains, they look at the broader environment and reasons why they get certain ratios.

Fenner, Tumen and Khatanbaatar (2014) examine changes in diet of the Mongolian people during this period of change in the 13th century. Primarily, they focus on whether diet changed more at the elite level, as

these individuals would have greater access to foreign items. As the Mongol Empire began, there is little written information available from themselves- however there are accounts of them from foreigners. By the early 13th century, there is written information from the elite of the Mongolian Empire, though it is limited. As pastoralists, it is expected that the diet of both elite and commoners will be focused on meat and other animal by-products. Their own history describes the range of meats they ate, and accounts from others also notes a preference for meat and dairy over vegetables or grains. Some grains are described in texts, but it is unknown whether this represents rice or millet- and if it was introduced into the diet later as the Mongols conquered agricultural territories.

Three cemeteries from the Empire period were investigated for this analysis: Tavan Tolgoi (interpreted as associated with the ruling elite), Tsagaan chuluut (interpreted as incorporating lesser elites and perhaps commoners) and Ulaanzuukh (mainly commoners). The burials from Tavan Tolgoi have significantly higher N15 values than either Tsagaan chuluut and Ulaanzuukh. Based on this, it would be assumed that the former is consuming more meat than the two latter sites, meaning that elites had more access to this type of food. However, they also compared the stable isotope ratios to other sites and analyses done in the broader region. From this, it appears that the isotopic differences may not be indicative of diet, but rather different environments which cause the nitrogen and carbon ratios to vary. They conclude that there were not substantial dietary differences despite the difference in grave goods. Fenner, Tumen and Khatanbaatar (2014) note that sample size for this was small, and future studies should investigate the environmental links further.

A new study by Touzeau et al. 2014 uses stable isotope analysis of various human tissue in order to better understand diet among the Egyptians. By combining these scientific studies with evidence from paintings and inscriptions, as well as analyses of the food remains themselves, they believe they will be able to more accurately understand the Egyptian diet. Their study included samples of human hair, enamel, and bone collected from Egyptian mummified heads and Predynastic individuals found in the collection at the Musée des Confluences, Lyon, France. Many of the heads found within this collection have the location they were found in, as well as era they date to, attached to them. Only individuals with this data were included in the study. Previous study of the collection found that all individuals were under 40 years, and were of the middle class- providing a different perspective from what

paintings and inscriptions usually offer. There was variable preservation among the individuals, the majority consisted of only bone, but a number also had teeth and hair available for sampling.

Strontium analysis of human remains from this period further supports the archaeological evidence that most individuals that lived in Egypt ate primarily what grew in Egypt. Based on the ratios of isotopes, Touzeau et al. (2014) argue that the middle class Egyptians subsisted primarily on a ovo-lacto vegetarian diet: this means that they ate primarily plants, fruits, vegetables, as well as animal byproducts such as milk and cheese. Meat consumption made up around 20% of their diet, although in some it was as high as 50%. However, in contrast with modern omnivores where the diet is 64% meat, they are more heavily vegetarian even at their highest percentage. They found that there was a major difference in Carbon 13 ratios between early forming teeth and bone and later forming teeth. This difference is usually attributed to the change in diet associated with weaning. However, here they question whether this difference is also related to formation processes of the different structures of teeth and bone in addition to the changes between childhood and adulthood. Further, they argue that the higher Nitrogen 15 ratios in some of the individuals can be attributed to the aridity of the environment, not differences in seafood consumption.

These two studies are interesting not only for what they reveal about dietary habits, but that they question some of the traditional assumptions about stable isotope ratios. There's a world of interpretations out there that stable isotope analysis can reveal to us, and personally I like that there are more nuances to this type of evidence than we've previously seen. By carefully assessing stable isotope analysis in hair, teeth and bone we can learn about diet from infancy to adulthood, about life course changes, and the climate which their food grew or lived in.

Works Cited

Fenner, J., Tumen, D., & Khatanbaatar, D. (2014). Food fit for a Khan: stable isotope analysis of the elite Mongol Empire cemetery at Tavan Tolgoi, *Mongolia Journal of Archaeological Science*, 46, 231-244 DOI: 10.1016/j.jas.2014.03.017

Touzeau, A., Amiot, R., Blichert-Toft, J., Flandrois, J., Fourel, F., Grossi, V., Martineau, F., Richardin, P., & Lécuyer, C. (2014). Diet of ancient Egyptians inferred from stable isotope systematics *Journal of Archaeological Science*, 46, 114-124 DOI: 10.1016/j.jas.2014.03.005

BOOK REVIEWS

David Hill, Associate Editor

Soils, Climate & Society: Archaeological Investigations in Ancient America, edited by John D. Wingard and Sue Eileen Hayes. 2013. University of Colorado Press, Boulder Colorado.

Reviewed by William Eckerle, Western GeoArch Research, LLC (bill.eckerle@westerngeoarch.com)

John Wingard and Sue Hayes' (2013) edited volume, *Soils, Climate & Society: Archaeological Investigations in Ancient America*, is a valuable resource for understanding the ecological basis of crop production and demographic change in New World archaeology.

Woods, Denevan, and Rebellato's lead off with *Population Estimates for Anthropogenically Enriched Soils (Amazonian Dark Earths)* attempting to assess the prehistoric population of the Amazon River basin by reference to the agricultural potential of Amazonian Black Earth soils (*terra prieta*). These productive, carbon enriched soils are surrounded by large areas of highly weathered and nutrient-poor Oxisols. The authors utilize several methods to calculate prehistoric population with reference to the *terra prieta* soils. They identify several problematic methodological issues but conclude that both are in agreement with dark earth soils supporting 3.09-3.73 million inhabitants

Wells, Davis-Salazar, and Kuehn take a hands-on, geoarchaeological approach in *Soilscape Legacies: Historical and Emerging Consequences of Socioecological Interactions in Honduras*. Using soil pits and probes they amass data on the nutrient content of various soils in Narco Valley, Honduras. They document changes in soil properties over time ("soilscape legacy") includes degradation caused by overuse and erosion caused by clearing which lowered productivity possibly as a result of demographic pressure during the Late Classic period.

Drought, Subsistence Stress, and Population Dynamics: Assessing Mississippian Abandonment of the Vacant Quarter by Meeks and Anderson tie abandonment by late Mississippian populations in the Vacant Quarter to drought occurring ~ AD 1420. Meek and Anderson point out the importance of an agricultural surplus as a buffer against drought-induced crop failure and attribute the lack of an adequate buffer of stored food to the demographic changes.

Pool examines drought as a causative agent in *Mimbres Mogollon Farming: Estimating Prehistoric Agricultural Production during the Classic Mimbres Period*. The author cites cultural changes ~AD 1130-1200 attributed to reduced precipitation or increased population. Decision Support System for Agrotechnology Transfer (DSSAT) software is used to assess crop yields. Prehistoric populations are estimated from identified domestic room numbers. Annual maize production estimates are regressed against the dendrochronological data suggesting that neither drought nor population increase are the only reason for Mimbres collapse, but that the lack of a storable surplus made competitive feasting risky leading to changes in social structure.

Hayes, in her chapter, *So Who's Counting: Modeling Prehistoric Agricultural Potential in the Maya World*, investigates how well EPIC (Environmental Policy Integrated Climate) predicts population at a site with postulated stable climate and resistance to soil erosion at the Baking Pot site in Belize. EPIC allows the comparison of various crop management strategies that could be used to buffer seasonal variability in timing of rainfall. She concludes that if all structures were simultaneously occupied, EPIC estimates are within acceptable ranges.

Wingard's assessment of agricultural productivity and cultural change at Copán combines geoarchaeological fieldwork (soils mapping) with the EPIC model to assess demographic and cultural shifts at this important site in Honduras. *Tilling the Fields and Building Temples: Assessing the Relationship among Land, Labor, and Classic Maya Elite Power in the Copán Valley, Honduras* assesses agricultural crop management strategies to determine loss of soil productivity from nutrient loss over time and resultant reduction in supportable population. Simulations suggest that population was fairly low during Early Classic times, but increased dramatically during the Late Classic period forcing an expansion of the agricultural land base and decentralizing population. He concludes that as population grew, more distant soils would have been brought under production possibly causing the power of the elites to decline.

Hayes follows with *An EPIC Challenge: Estimating Site Population in South Coastal Peru*. This assessment of agricultural productivity and population occurs at sites along the Majes (Camaná) River. Architecture was vandalized preventing use to reconstruct population. EPIC simulations were done on maize alone, maize and beans, and beans alone (winter rotation). Results show decreasing yields in maize, but not so much with beans due to their ability to fix nitrogen. Increasing

temperatures, a function of distance from the coast also show decreasing yields. The author concludes that despite data gaps (local soils and weather data), EPIC is useful for population estimates when architecture is lacking.

Christine Dixon utilizes EPIC to assess agricultural productivity in her chapter *Feeding the Masses: New Perspectives on Maya Agriculture from Cerén, El Salvador*. The site was buried by volcanic tephra in AD 600 resulting in excellent preservation. EPIC simulation documents higher yields than ethnographic accounts. Plaster casting of above ground plant parts yields evidence for crop bed preparation and plant spacing. Systematically-prepared manioc beds indicate that it was an important dietary component and may have insured against failure of maize crops.

How Can We Know? The Epistemological Foundation of Ecological Modeling in Archaeology by Sissel Schroeder is a call to carefully examine crop productivity assumptions. While ethnohistoric observations were generally unsystematic, recent modeling is biased by enhanced productivity resulting from modern agricultural methods. Archaeological experiments with non-hybrid corn produce more realistic yield estimates, but modern models like EPIC are still unrealistically limited to monoculture yields.

Including the word "agricultural" in the volume title would have cued many a hunter and gatherer archaeologist to the orientation of volume but perhaps, like the reviewer, they would have enjoyed and benefited from reading it. This volume provides a useful cross-section of current attempts to assess prehistoric American agriculture in a way that is useful for predicting population change and its effect on the trajectories of cultural systems.

REMOTE SENSING AND PROSPECTION

Apostolos Sarris, Associate Editor

Educational Frontiers in Archaeo-geophysical Prospection

Q. Drillat, *University of Strasbourg*

Geophysical prospection is a nondestructive method. This is essential in archaeology, a discipline which deals with the irreversible and destructive excavation process. Moreover, geophysical data open new perspectives in archaeological studies: geophysical prospection-mapping allow archaeologists to better perceive spatial

organization and land use of ancient sites and landscapes¹. Archaeological geophysics is also a fast methodology in terms of coverage, becoming a handy tool for archaeologists involved in construction and development works.

Even if archaeological geophysics is increasingly gaining an important part in archaeological sciences, training in this particular field is not well established. Institutes in which students can learn and practice geophysical applications in archaeology are rare. The purpose of this document is to present an inventory of the main educational opportunities in archaeological geophysics.²

Degrees in archaeological geophysics

Few places offer a full training in archaeological geophysics (or shallow depth geophysical prospection methods). In fact, the University of Bradford³ (UK) is probably the only institute offering a full MSc degree in archaeological prospection. Supported by a specialized laboratory and a full suite of prospection equipment, students acquire knowledge and can get hands-on training under the Department of Archaeological and Environmental Science. Other than the University of Bradford, only a few courses are available in archaeological geophysics from other academic foundations. There is no other university which dispenses a full degree in the field.

Geophysics can also be used underwater to improve possibilities of archaeological research. A few years ago, the University of Rhode Island (USA) initiated a special degree in archaeological oceanography⁴: a PhD in oceanography and an MSc in archaeology.

Research Institutes

There are numerous university departments and research institutions where teaching curricula include lectures on geophysical prospection. The Initiative College for Archaeological Prospection (IC-ArchPro⁵) – which has

¹About perception of spatial organization of archaeological sites, see for example:

Gondet, S., Benech, C., *Application of the space syntax to the study of city planning from Syrian Late Bronze Age circular cities*, Archéosciences, 33 (suppl.), 2009, 217-219.

Gondet, S., Castel, C., *Prospection géophysique à al-Rawda et urbanisme en Syrie au Bronze Ancien*, Paléorient, vol. 30/2, 2004, 93-109.

² Obviously, this paper is not an exhaustive list and some departments, centers or institutes might have been unintentionally disregarded during the compilation.

³ <http://www.brad.ac.uk/life-sciences/our-courses/postgraduate-taught/m-sc-archaeological-prospection-shallow-geophysics/>

⁴ <http://www.uri.edu/news/ballard/institute.htm>

⁵ <http://ic-archpro.univie.ac.at/home/>

been created as a pole for PhD students and researchers in landscape archaeology at the University of Vienna (Austria) – is providing courses parallel to its research activities.

The Center for Advanced Spatial Technologies⁶ at the University of Arkansas is another important research center for geophysical prospection and geophysical/spatial data analysis in archaeology. Similar research is conducted in the Laboratory of Geophysical-Satellite Remote Sensing & Archaeoenvironment (GeoSat ReSeArch) of the Institute for Mediterranean Studies (IMS) – F.O.R.T.H.⁷ (Greece). The laboratory provides hands-on training and regularly organizes specialized workshops in the discipline.

The University of Glasgow (UK) has developed an academic program combining geophysics and archaeology with a focus on landscapes⁸. Similar programs also exist in the University of Kiel⁹ (Germany), the Johannes Gutenberg University of Mainz¹⁰ (Germany) and the University of Georgia¹¹ (USA).

Finally, centers like the Archaeological Prospection Group Munich at the Bavarian State Department for Monuments and Sites (BLFD) at the University of Munich¹² (Germany) and the Archaeological Prospection Service at Southampton (APSS) at the University of Southampton¹³ (UK), provide geophysical survey services in collaboration with a number of academics partners.

Abovementioned centers and research institutes may also host post-graduate and PhD students as well as PostDoc researchers, and thus, they offer productive playgrounds for research and help in training younger generation of archaeologists and geophysicists.

Conferences, workshops and journals

Students and researchers in archaeological geophysics attend a number of specialized conferences, such as the annual meeting of the *International Society for Archaeological Prospection*¹⁴ or the biannual meeting on

⁶ <http://cast.uark.edu/home/research/geophysics.html>

⁷ http://www.ims.forth.gr/index_main.php?c=14&l=e&s=&p=1

⁸ <http://www.gla.ac.uk/schools/humanities/research/archaeologyresearch/h/strengths/landscapepractice/>

⁹ <http://www.ifg.uni-kiel.de/1301+M52087573ab0.html>

¹⁰ http://www.geowiss.uni-mainz.de/252_ENG_HTML.php

¹¹ <http://geology.uga.edu/index.php/research/891>

¹² <http://www.munich-geocenter.org/research/geophysics>

¹³ http://www.southampton.ac.uk/archaeology/research/groups/archaeological_prospection_service_southampton.page?#overview

¹⁴ <http://www.archprospection.org/agms>

Recent Work in Archaeological Geophysics organized by the Near Surface Geophysics Group of the Geological Society of London¹⁵. Furthermore, targeted workshops receive large attention each year. In fact, workshops and training courses are one of the best ways to learn about and progress in archaeological geophysics. The large numbers of applications at each workshop shows the large pool of interest coming from researchers and students.

Finally, there are scientific journals: from specialized journals on archaeogeophysics and remote sensing to journals on archaeology or geophysics (which sometimes contain case studies on archaeological geophysics). *Archaeological Prospection*, *Archaeometry*, the *Journal of Archaeological Science*, the *Journal of Applied Geophysics*, *Near Surface Geophysics*, *Geophysical Prospecting* and *Antiquity* are noteworthy. Institutes, associations and groups also produce publications about their work, such as the newsletter of ISAP, Archaeotelepiskopika Nea (IMS-FORTH) or Discovery and Excavation in Scotland (DES). They also fulfill online databases where geophysical surveys are available to the public like English Heritage¹⁶, Archaeology Data Service¹⁷ and Canmore¹⁸.

Discussion

Despite the steadily increasing number of students who show interest in archaeological geophysics, training through an academic curriculum is not an easy task. Since there is only one university which offers a full degree in archaeological geophysics, students must find their own ways to get more in depth knowledge and training. They can join research projects, attend workshops and training courses, or carry out their own MSc and PhD projects, guided by professionals. These remain the only ways to gain “hands on” experience in both using the hardware and instrumentation as well as the interpretation of results.

Students who are getting education in geophysics and archaeology have been observing the gap between the two fields. Without an involvement in a research project, archaeological geophysics remains yet another methodological tool which rests in the textbook. Dialogue between archaeologists and geophysicists is most definitely needed. And, this kind of dialogue is easier to achieve through the renovation of normative curricula of archaeology departments all around the world.

¹⁵ <http://www.nsgg.org.uk/meetings/old/>

¹⁶ <http://www.english-heritage.org.uk/>

¹⁷ <http://archaeologydataservice.ac.uk/>

¹⁸ <http://canmore.rcahms.gov.uk/>

Acknowledgments

I am very grateful to Dr. A. Sarris (IMS-FORTH) and Dr. T. Kalayci (IMS-FORTH) for their assistance. Many thanks to Dr. C. Cuenca Garcia (IMS-FORTH) for her profitable comments and to Dr. F.-X. Simon (IMS-FORTH) for his help. I also thank Bruno Gavazzi (UMR 7044, University of Strasbourg) for his help in the inventory of German research institutes.

References

Benech, C., Hesse, A., 2007. *Some Consideration on the Integration of Geophysical Data into Archaeological Research*, Geophysik und Ausgrabung. Einsatz und Auswertung zerstörungsfreier Prospektion in der Archäologie, Internationale Archäologie Naturwissenschaft und Technologie (ed.), pp. 175-186.

UPCOMING CONFERENCES

Rachel S. Popelka-Filcoff, Associate Editor

2014

15-17 May. Medieval copper, bronze and brass: History, archaeology and archaeometry of the production of brass, bronze and other copper alloy objects in medieval Europe (12th-16th centuries) – Dinant-Namur Belgium. General information: <http://www.laitonmosan.org>

19-23 May. International Symposium on Archaeometry (ISA). Los Angeles, CA, USA. General information: <http://www.archaeometry2014.com>

19-23 May. Current Archaeological Prospection Advances for Non-Destructive Investigations in the 21st Century. Aztalan State Park in Jefferson County, WI USA. General information: Steven L. DeVore: steve_de_vore@nps.gov, <http://www.cr.nps.gov/mwac/>

3-5 June. 9th International Symposium on the Conservation of Monuments in the Mediterranean Basin, Ankara, Turkey. General information: <http://monubasin9.org>

8-13 June. 20th World Congress of Soil Science. Jeju, Korea. General information: <http://www.20wcso.org>.

8-13 June. Goldschmidt, Sacramento, CA USA. General information: <http://goldschmidt.info/2014/>

25-28 June. New Zealand Archaeological Association Conference, Cambridge New Zealand. General

information:

http://www.nzarchaeology.org/cms/index.php?option=com_content&view=section&id=10&Itemid=60

7-11 July. 14th Luminescence and Electron Spin Resonance Dating conference (LED), Montreal, Canada. General information: <http://www.led2014.uqam.ca>

14-18 July. 4th Congress of the Pan African Archaeological Association for Prehistory and Related Studies and the 22nd Biennial Meeting of the Society of Africanist Archaeologists. Johannesburg, South Africa. General information: <http://www.paa2014.co.za/index.php/en/>

14-18 July. Oxford X Symposium on Archeoastronomy: Astronomy, Indigenous Knowledge, and Interpretation. Cape Town, South Africa. General information: <http://culturalastronomy.saa.ac.za>

22-25 July. HERITAGE 2014 4th International Conference on Heritage and Sustainable Development, Guimarães Portugal General information: <http://heritage2014.greenlines-institute.org/h2014website/>

3-7 August. Tephra 2014 - Maximizing the potential of tephra for multidisciplinary science. Portland, OR, USA. General information: <http://www.geohazards.buffalo.edu/documents/Tephra2014.shtml>

10-14 August. 248th National Meeting and Exposition, American Chemical Society. San Francisco, CA USA. General information: <http://www.acs.org>.

24-28 August. 8th International Conference on Isotopes and Expo, Chicago, IL USA. Session on isotopes and archaeometry. General information: <http://www.8ici.org>

1-7 September. XVII Congress of the International Union of Prehistoric and Protohistoric Sciences (UISPP). Burgos, Spain. Abstract deadline 30 April. General information: <http://www.burgos2014uispp.com>

10-12 September 2014. Synchrotron Radiation in Art and Archaeology. Paris, France. General information: <http://www.sr2a-2014.org>

15-19 September. International Council of Museums, Committee for Conservation (ICOM-CC) 17th Triennial Meeting. Melbourne, VIC, Australia. General information: <http://www.icom-cc.org/254/triennial-conferences/17th-triennial-conference,-melbourne,-australia/#.Ut4ShqWZ7v0>

18-20 September. 4th annual meeting of the European Society for the study of Human Evolution (ESHE). Florence, Italy. General information: <http://www.eshe.eu>

Sept 28-Oct 3, 2014. SciX Conference 2014. Reno-Tahoe, Nevada. General information: <http://www.scixconference.org>
Special symposium on "Chemistry in Art and Archaeology". Contact: Mary Kate Donais (mdonais@anselm.edu)

13-15 October. 5th International Conference on Remote Sensing in Archaeology: THE AGE OF SENSING. Durham, NC, USA. General information: <http://space2place.classicalstudies.duke.edu>

19-22 October. The Geological Society of America National Meeting. Vancouver, BC, Canada. General information: <http://www.geosociety.org/meetings/>.
Special session: "The Archaeological Record as a Paleoclimatic and Paleoenvironmental Archive"- Contact: Alice Kelley (akelley@maine.edu) or Dan Sandweiss (dan.sandweiss@umit.maine.edu) with a proposed title by May 1st. Special session: "Coastal Geoarchaeology" Contact: Eduard Reinhardt, ereinhar@mcmaster.ca or Joseph I. Boyce, boycej@mcmaster.ca

19-22 November. American Schools of Oriental Research Annual Meeting. San Diego, CA USA. General information: <http://www.asor.org/am/index.html>

1-3 December. AAA/ Australian Archaeological Association ASHA 2014 Joint Conference: Culture, Climate, Change: Archaeology in the Tropics. Cairns, Queensland, Australia. General information: <http://australianarchaeology.com/conferences/aaa2014-conference/>

3-7 December. American Anthropological Association 113th Annual Meeting. "Producing Anthropology" Washington DC USA. General information: <http://www.aaanet.org/meetings/>

15-19 December. American Geophysical Union Fall Meeting, San Francisco, CA USA. General information: <http://www.agu.org/meetings/>

7-12 December. Royal Australian Chemical Institute National Congress, Adelaide, SA Australia. Session on Chemical Analysis and Sensing in Conservation. General information: <http://www.racicongress.com/program.htm>

2015

8-11 January. Archaeological Institute of America Annual Meeting (AIA and APA Joint Annual Meeting), New Orleans, LA USA. General information: <http://aia.archaeological.org/webinfo.php?page=10096>
Special session: "Getting Elemental: Integrating Isotopes and Archaeology" Co-organizers: Catherine M. Kearns (Cornell University) and Jeffrey F. Leon (Cornell University)
Contact: archisotope@gmail.com.

8-11 January. Archaeological Institute of America Annual Meeting, New Orleans, LA, USA.
<http://aia.archaeological.org/webinfo.php?page=10096>

6-15 January. Society for Historical Archaeology Conference, Seattle, Washington USA. General information:
http://www.sha.org/index.php/view/page/annual_meetings

8-12 March. Pittcon Conference and Expo, New Orleans, LA USA. General information: <http://www.pittcon.org/>

22-26 March. 249th National Meeting and Exposition, American Chemical Society. Denver, CO USA. General information: <http://www.acs.org>.

25-29 March. American Association of Physical Anthropologists 84th Annual Meeting. St. Louis, Missouri USA. General information: <http://physanth.org/annual-meeting>

Cotsen Institute of Archaeology
University of California, Los Angeles
A210 Fowler Building
Los Angeles, CA 90095-1510

ADDRESS SERVICE REQUESTED

Please send subscription address change to SAS Administration

SAS BULLETIN

NEWSLETTER OF THE SOCIETY FOR ARCHAEOLOGICAL SCIENCES

SAS BULLETIN STAFF

Editor: **Vanessa Muros**, UCLA/Getty Conservation Program, Cotsen Institute of Archaeology, A210 Fowler Building, Los Angeles, CA, 90095-1510, USA; tel 310-825-9407; email vmuros@ucla.edu

Associate Editor, Archaeological Ceramics: **Charles C. Kolb**, Independent Scholar (retired NEH), 1005 Pruitt Court, SW, Vienna, Virginia 22180-6429, USA; tel 703-242 0063, email CCKolb.13@gmail.com

Associate Editor, Archaeological Chemistry: **Ruth Ann Armitage**, Department of Chemistry, Eastern Michigan University, Ypsilanti, MI 48197, USA; tel 734-487-0290; email rarmitage@emich.edu

Associate Editor, Archaeometallurgy: **Thomas R. Fenn**, Visiting Scholar School of Anthropology, The University of Arizona, Emil W. Haury Anthropology Bldg., #30, 1009 E. South Campus Drive, P.O. Box 210030, Tucson, AZ 85721-0030, USA; email tfenn@email.arizona.edu

Associate Editor, Bioarchaeology: **Katy Meyers**, Department of Anthropology, Michigan State University, East Lansing, MI 48824, USA; tel 585-269-9778; email kmeyers35@gmail.com

Associate Editor, Book Reviews: **David V. Hill**, 2770 S. Elmira St., #38, Denver, CO 80321, USA; tel (303) 337-2947; email dhill1@att.net

Associate Editor, Dating: **Gregory W.L. Hodgins**, Physics and Atmospheric Sciences, NSF Arizona AMS Facility, 1118 E. 4th Street, University of Arizona, Box 0081, Tucson, AZ 85721, USA; tel 520-626-3619; email ghodgins@physics.arizona.edu

Associate Editor, Geoarchaeology: **Jane A. Entwistle**, Geography, School of Applied Sciences, Northumbria University, Sandyford Road, Newcastle upon Tyne NE1 8ST, UK; tel 44(0)191-227-3017; email jane.entwistle@northumbria.ac.uk

Associate Editor, Maritime Archaeology: **Nicolás Ciarlo**, National Institute of Anthropology, 3 de febrero 1370/78 (C1426BJN), Ciudad de Buenos Aires, Argentina; tel (office): +54 (11) 4 784 – 3371 / 4 783 – 6554; email maritime.historical.archaeol@gmail.com

Associate Editor, Meeting Calendar: **Rachel S. Popelka-Filcoff**, School of Chemical and Physical Sciences, Physical Sciences Building, Flinders University, Adelaide, South Australia 5001, Australia; tel (61) 8 8201 5526; email rachel.popelkafilcoff@flinders.edu.au

Associate Editor, Remote Sensing and Prospection: **Apostolos Sarris**, Laboratory of Geophysical-Satellite Remote Sensing & Archaeoenvironment, Foundation of Research & Technology Hellas, Melissinou & Nikiforou Foka 130, P.O. Box 119, Rethymnon 74100, Crete, Greece; tel (30)-831-25146; email asaris@ret.forthnet.gr

SAS EXECUTIVE OFFICERS

President: **Robert H. Tykot**, Department of Anthropology, University of South Florida, 4202 E. Fowler Ave., Tampa, FL 33620-8100, USA; tel 813-974-7279; email rtykot@cas.usf.edu

Vice President/President-elect: **Marc Walton**, Research Associate Professor, Materials Research Science and Engineering Center, Northwestern University, 2145 Sheridan Road TECH K111, Evanston, IL, 60208, USA; email marc.walton@northwestern.edu

Past President: **Patrick Degryse**, Geology, Katholieke Universiteit Leuven, Celestijnenlaan 200 E, B-3001 Heverlee, Belgium; tel +32-16-326460; email Patrick.degryse@ees.kuleuven.be

SASweb & SASnet: **Destiny L. Crider**, Department of Anthropology, Koren 319, Luther College, 700 College Dr., Decorah, IA 52101, USA; email cridde01@luther.edu

SASblog: **Robert S. Sternberg**, Department of Earth and Environment, Franklin & Marshall College, Lancaster, PA 17604- 3003, USA; tel 717-291-4134; email rob.sternberg@fandm.edu

Vice President for Intersociety Relations: **Adrian L. Burke**, Département d'Anthropologie, Université de Montréal, C.P.6128, succursale Centreville, Montréal QC H3C 3J7, Canada; tel 514-343-6909; email adrian.burke@umontreal.ca

Vice President for Membership Development: **Dawn Janney**, 791 Dickson Ave., Idaho Falls, ID 83402 USA; tel 208-552-6633; email dejanney@earthlink.net

Publications Coordinator: SAS Editor for Archaeometry: **James H. Burton**, Department of Anthropology, University of Wisconsin, Madison, WI 53706-1393, USA; tel 608-262-4505; email jhburton@facstaff.wisc.edu

SAS ADMINISTRATION

General Secretary: **Robert S. Sternberg**, Department of Earth and Environment, Franklin & Marshall College, Lancaster, PA 17604-3003, USA; tel 717-291-4134; email rob.sternberg@fandm.edu

Published quarterly by the Society for Archaeological Sciences

Distributed to subscribers: \$20/yr regular membership (electronic); \$25/yr regular membership (paper);

\$15/yr student and retired (electronic); \$20/yr student and retired (paper); \$35/yr institutional; \$300 lifetime.

Individuals add \$115/yr for *J. of Archaeological Science*; \$45/yr each for *Archaeometry* and *Archaeological & Anthropological Sciences*. ISSN 0899-8922.