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A MESSAGE FROM THE PRESIDENT



It should be no surprise to SAS members that I am the new president, since it was two years ago that I became president-elect. But I would officially like to thank everyone for their support, and I am open to your suggestions and comments on what we can try and accomplish in the

next two years. FYI, I am a Professor in the Department of Anthropology at the University of South Florida in Tampa, where I regularly teach courses on Archaeological Science, Ancient Trade, and Ancient Diets, and also hosted the 2010 International Symposium on Archaeometry. My research interests have focused mainly on the application of elemental and isotopic methods of analysis to study ancient trade/exchange, mobility, technology, and dietary practices, specifically on obsidian, marble, and other stone; ceramics; metals; and human/faunal remains. This research has expanded geographically from my original focus on the central Mediterranean to six of the seven continents, collaborating with archaeologists from many countries.

I have been a member of SAS for more than 20 years, and served previously as Book Review Editor (1991-97) and

Bulletin Editor (1997-2005). Already on my agenda as the new president is continuing to discuss and potentially establish formal relations with the organizers of the biennial International Symposium on Archaeometry (ISA), which will be hosted in 2014 at the Getty in California by new SAS president-elect Marc Walton. Related to this are negotiations underway with some publishers about ISA proceedings, as well as a new book series for SAS members to contribute to. In addition, I have already started on raising funds for a greater amount and number of student research and poster awards, and SAS will advertise this when formalized.

I hope that everyone has a productive summer - I will be working with several colleagues to investigate trade and contacts in prehistoric Italy, using a pXRF on obsidian and ceramics both in the field and on collections in several museums.

Robert H. Tykot

ARCHAEOLOGY, SCIENCE AND THE ROAD TO CONSERVATION-A NOTE FROM THE NEW EDITOR

During my undergraduate studies at Boston University I gravitated towards archaeology because it appealed to my interests in history, cultural studies, and science. I focused on the Upper Paleolithic of Europe and how evolutionary changes or differences could be reflected in material culture. I was content on this path until I took a course on basic field conservation techniques for archaeologists. It was in archaeological conservation that I found a discipline that truly incorporated the many fields I was interested in and included laboratory and field work. Once I was exposed to the multidisciplinary nature of cultural heritage preservation, and the fact that I was able work directly with, and conserve, the physical remains of past cultures, there was no turning back.

Throughout my graduate studies in conservation at University College London and my career as an archaeological conservator, I have been able to continue using archaeology and scientific studies to serve both archaeological research and the preservation of cultural material, both within museums and on archaeological

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excavations worldwide. It is this intersection of archaeology and science in my research, focusing primarily on the study of ancient metals and glass, and the multidisciplinary of conservation, that led me to become involved with the SAS.

As the new editor of the *Bulletin*, I hope to continue to produce issues that are enlightening and present the latest research in archaeological science. In this issue, summaries of the recent American Chemistry Symposium and various symposia from the Society for American Archaeology Annual Meeting show the breadth of research currently taking place in the field. Future issues will continue this thread and inform on new areas of research.

As a lecturer in the UCLA/Getty Conservation Program at UCLA's Cotsen Institute of Archaeology, I am involved in many education and outreach efforts. I hope to also use the *Bulletin* as an education and outreach tool to increase membership, introduce archaeological science to a broader audience, increase the presence of students in the organization, and attract those working in a range of specialties who conduct scientific studies of archaeological material to join the SAS. Awards such as the *R. Ervin Taylor Student Poster Award*, the winner of which is announced in this issue, help to increase student participation in the dissemination of research at conferences such as the SAA's. This poster, along with the other presentations given by students at the recent conferences summarized, show the contribution young scholars are making to the field.

Finally, many thanks go to Jay VanderVeen for all his hard work as the previous editor. As I take over this new position, I hope to live up to the standard he set for the *Bulletin*.

Vanessa Muros



Photo credit: Ali Alkhatib/UMAP

ANNOUNCEMENTS

Awards

Congratulations to R. Kyle Bocinsky, (Washington State University), the winner of the 2013 *R. Ervin Taylor Student Poster Award*. Kyle's poster, *The Defensive Coast*, was chosen from many submissions demonstrating innovative contributions to archaeological research through the application of scientific methods. The poster was presented in the "Landscapes and Spatial Analysis: Global Case Studies" session at this year's Society for American Archaeology's 78th Annual Meeting in Honolulu, Hawaii. The abstract is as follows:

Recent attempts to create an index of site defensibility for the Northwest Coast and elsewhere have used a null model of zero defensibility; i.e., the site does not have any defensive advantage when approached from its immediate surroundings. Such a model is useful for comparing sites to one-another, but does not necessarily reflect an agent's consideration of defensibility when choosing a place to be on a landscape. Instead, people make decisions in the context of their local and regional environments: their set of possible choices. In order to understand the importance of defensibility in past peoples' behavior, we must first quantify the defensibility of their landscapes. In this paper, I build off a defensibility index developed by Martindale and Supernant (2009) by fully specifying their geospatial indices pertaining to visibility and elevation and adapting them to a raster landscape (a digital elevation model). I then examine the defensibility of recorded pre- and post-contact archaeological sites in the Gulf of Georgia and lower Fraser River valley of British Columbia in light of the baseline defensibility of the landscape. By doing so I am able to consider to what extent peoples' initial decisions of where to build are defensive.

References Cited

Martindale, A. and K. Supernant. 2009 Quantifying the Defensiveness of the Defended Sites on the Northwest Coast of North America. *Journal of Anthropological Archaeology* 28(2): 191-204.

SAS Board Changes

Congratulations to Dr. Marc Walton who has been elected vice president/president-elect. Marc earned a D.Phil. from the University of Oxford in archaeological science and a MA in art history, as well as a diploma in the conservation of works of art, from the Institute of Fine

Arts of New York University. After graduate school, Dr Walton spent two years at the Los Angeles County Museum of Art prior to going to the Getty Conservation Institute in 2005, where he is responsible for the scientific study of antiquities in the J. Paul Getty Museum. His research has resulted in publications that have described a diverse range of art materials and has focused on trade and manufacture of ancient objects.

Thank you to Patrick Degryse for his service as president. As Marc begins his term as president-elect and Rob Tykot takes over as president, we look forward to the direction their leadership will take the organization.

Archaeometric Methods, Archaeological Materials & Ancient Technologies, an SAS Sponsored Symposium
(Contributed by Vanessa Muros and Dr. Ioanna Kakoulli, UCLA/Getty Conservation Program)

The SAS sponsored a symposium at this year's Society for American Archaeology's 78th Annual Meeting in Honolulu, HI entitled "Archaeometric Methods, Archaeological Materials & Ancient Technologies". The session brought together professionals and students in the field of archaeology and conservation to present their research on the use of instrumental analysis for the characterization of ancient and historic materials. The aim was to create a discussion of the advantages and limitations of different techniques based both on hardware design and application methodology, and the pitfalls in the acquisition and interpretation of results. Using research from sites and collections all over the world, the papers focused on the methods of acquiring the data and how the data is treated in light of the complexities posed by the heterogeneous nature of archaeological materials including the alterations that they undergo during burial. The presenters described how the heterogeneity of the artifacts, the difficulty of analyzing artifacts that cannot be sampled, and how condition/preservation issues affect the techniques that can be used, the choice of analytical methodology and the interpretation of results. The session ended with SAS president Rob Tykot providing an overview of the papers and a synthesis of the research presented in relation to the theme of the session.

Overall, the session provided an opportunity for an exchange of current research in archaeometric methods while highlighting some of the difficulties faced when analyzing archaeological material. The session was also unique in that it actively sought the participation of those in the preservation field as a way to increase the presence of those in this specialty at the SAA's and demonstrate

the contribution of conservators and conservation scientists to archaeological research.

The papers presented in the session were:

- *Several Roads Lead to Chichén Itzá: Tracing the Fabrication Histories of Metals Deposited in the Cenote Sagrado*-Bryan Cockrell, José Luis Ruvalcaba Sil, and Edith Ortiz Díaz
- *The Jaina-style Figurine Project: Portable Technologies, Advantages and Limitations*-Ioanna Kakoulli, Christian Fischer, Carinne Tzadik, Sandra L. Lopez Varela, Christian De Brer, Kim Richter
- *Integrated Archaeometric Analysis of the Context and Contents of an Ulúa-style Marble Vase from the Palmarejo Valley, Northwest Honduras*-E. Christian Wells
- *Panama Purple: Investigating a Misunderstood Technique*-Kathryn Etre
- *Changes in Mortuary Ceramics and Ritual between the Middle and Late Intermediate Periods (A.D. 500-1450): Using pXRF in Northern Chile*-Emily Stovel, Michael Deibel, and William Whitehead
- *Reassessing the Diagnostic Capabilities of GC-C-IRMS Analyses of Organic Residues in Archaeological Pottery: A Preliminary Report*-Michael Gregg and Greg Slater
- *Sandstone Raw Materials from Eastern France: Evaluation of Non-invasive Portable Technologies as Potential Tools for Characterization and Sourcing* -Brittany Dolph and Christian Fischer
- *Analyzing Deteriorated Glass Using pXRF: A Preliminary Study of Vitreous Beads from the Late Bronze Age/Early Iron Age Tumulus of Lofkënd*-Vanessa Muros
- *Characterization of 5th C. B.C. Athenian Pottery Black Gloss Slips*-Marc Walton, Karen Trentelman, Brendan Foran, Apurva Mehta, Jeffrey Maish, David Saunders, Neil Ives and Miles Brodie

- *Empire without a Voice: Phoenician Iron Metallurgy and Imperial Strategy at Carthage*-Brett Kaufman
- *Comparison between 3D Geometric Morphometric Analysis over Traditional Linear Methods in Lithic Assemblages: Tor Faraj, Jordan, a Middle Paleolithic Site as a Case Study*-Colleen Bell, Miriam Belmaker, and Donald Henry
- *Lipid Analysis and Plant Residue Identification: New Perspectives*-Cynthianne Debono Spiteri, Amanda Henry, and Oliver E. Craig

ARCHAEOLOGICAL CERAMICS

Charles C. Kolb, Associate Editor

This issue contains two topics: 1) Book reviews on ceramic topics and 2) ceramic papers and posters at the 2013 Society for American Archaeology annual meeting. An update on a promised review: The book, *Archaeological Ceramics in Thin Section: a Colour Guide*, by Patrick Sean Quinn and Peter Martin Day (New York: Springer Verlag, 2013), originally scheduled for publication in June 2012, has been delayed at least three times; the anticipated publication date is now 28 June 2013. Another volume, *Ceramic Petrography: The Interpretation of Archaeological Pottery & Related Artefacts in Thin Section* has also been prepared by Patrick Sean Quinn (Oxford: Archaeopress, 2013). These two volumes may lend themselves to a comparative review to be published in a forthcoming issue.

I recently retired from the National Endowment for the Humanities but can be reached by email at CCKolb.13@gmail.com. Many thanks to our *SAS Bulletin* editor, Jay VanderVeen, who has taken on new duties at Indiana University South Bend and will be stepping down from the editor's position. He has done a splendid job of keeping the *Bulletin* on track and on time.

Book Reviews

La Cerámica Arqueológica en la Materialización de la Sociedad: Transformaciones, Metáforas y Reproducción Social [*Archaeological Ceramics in the Materialisation of Society: Transformations, Metaphors, and Social Reproduction*], María Cecilia Páez and Guillermo Adrian De La Fuente (eds.). South American Archaeology Series 14, Andrés D. Izeta (ed.), IV Reunión Internacional de Teoría Arqueológica Sudamericana Inter-Congreso del

WAC [World Archaeological Congress] 3-7 de Julio de 2007, Catamarca, Argentina. British Archaeological Reports International Series S-2294. vii + 140 pp. ISBN-13: 978-1-4073-0871-5, ISBN-10: 1-4073-0871-8, £28.00/\$70.00 US (paperback).

The papers in this volume derive from a World Archaeological Congress in 2007 (noted above) coordinated by De La Fuente and Páez. Dr. Guillermo A. De La Fuente and Lic. María Cecilia Páez (Escuela de Arqueología, Universidad Nacional de Catamarca, Catamarca, Argentina) were the symposium coordinators and also contributed to this volume which contains an "Introduction" and nine essays, mostly by Argentinean archaeologists but with chapters by colleagues from Brazil, Chile, and the United States. The oral presentations focused on various South American contexts and sought to examine the role of archaeological ceramics in the social processes of past societies, specifically with respect to the formulation and reformulation of cultural practices. Six contributions concern ceramics from Argentina, and there are single contributions dealing with pottery from Brazil, Chile, and Ecuador.

The authors provide critical discussion with respect to the limitations of various theoretical approaches to the study of archaeological ceramics. The organizers also point out that material practices in society constitute a medium through which cultural behaviors are kept and reinforced through time, but they also provide the structure or matrix through which social transformations occur. As one example, in Andean societies pottery constitutes one of the material aspects of greatest significance participating in most other realms of cultural life (social and technological relationships, ideology, religion, etc.). Pottery-making practices are an active medium through which the social, political, and economic orders are continuously formulated and reformulated. From this perspective, technical behaviors comprising these practices are culturally and socially determined, participating in and being closely linked to other spheres of social life. The contributors do not see the material qualities of artifacts as necessarily determining their meanings, but, on the contrary, it is necessary to move beyond the descriptive and functional analysis of archaeological ceramics, linking them with the social relationships involved in pottery-making practices, the form in which material properties in ceramics are symbolized, and the way in which these practices contribute to the creation and re-creation of social subjects.

Guillermo A. De La Fuente and María Cecilia Páez, “Introducción” (pp. 1-8, 43 references). The editors state that the following papers focus on the archaeology of ceramic craft production through multiple lines of study and analysis that result in cultural interpretations of the materials being studied. The first group of papers emphasizes the use of theoretical models or paradigms and the latter chapters emphasize anthropological and technological analyses. The initial contributions employ older (Mauss 1934, 1938; Leroi-Gourhan 1943, 1945, 1964, 1965) and more recent concepts (Dobres and Robb, eds., 2000; Tilley 1994, 2004), and the later chapters tend toward the works of Gosselain (1992, 1999, 2000) and Sillar (1999, 2000). There are also brief syntheses of the nine chapters.

Verónica Puente (PROHAL, Universidad de Buenos Aires, UBA-CONICET) “Abordando el Estudio de las Prácticas Alfareras desde Material Arqueológico Fragmentario” (pp. 9-25, 6 figures, 5 graphics, 3 tables, 1 map, 79 references). Puente employs an “anthropology of technology” approach, considering methods and processes of ceramic production at the Late Period site of La Angostura (Depto. de Belén, Provincia de Catamarca) in northwest Argentina. She examined 343 sherds (73% body sherds) in terms of form/morphology of rims, bases, bodies, and handles; vessel types; construction stages; colors, and decoration. From these she infers the selection of raw materials (clay and temper) and construction techniques, employing procedures detailed in Rice (1987) and Rye (1981). Twenty-nine paste groups were discerned and her studies also document aplastics, porosity, and firing techniques. The writings of Dobres, Lemonnier, and M. Stark figure in her assessment. Brenda Bowser is misspelled as Browser (p. 10, 22).

Francisco Garrido Escobar (Departamento de Antropología, Universidad de Chile) “Identidades y Cambio en la Transición del Período Medio al Intermedio Tardío en el Valle de Copiapó (Chile)” (pp. 27-44, 10 figures, 1 table, 45 references). The author employs Bourdieu’s (1988, 1990) concept of *habitus* in the analysis of Middle Period ceramic styles from the Copiapó Valley of northern Chile in determining ethnic identity. This essay is based on Garrido’s thesis (2007). Animas I, II, III, and IV styles and Copiapó specimens are examined in terms of decorative styles, symmetry, and motifs (following Washburn’s work 1977, Washburn and Crowe 1988) and theories proposed by Hodder (1979) and Wobst (1977). Eight radiocarbon dates are also provided. Anna Shepard is incorrectly cited as Anne Sheppard (p. 30).

André Prous (FAFICH / Sector Arqueología, Universidad Federal de Minas Gerais, Brasil) and Camila Jácome (PPGAN / Sector Arqueología, Universidad Federal de Minas Gerais, Brasil) “El ser por el hacer. La socialización y la identidad expresadas por la cerámica Tupiguaraní” (pp. 45-58, 5 figures [1 in color], 1 table, 43 references). Prous and Jácome’s chapter focuses on the southeastern Brazilian highlands and women potters Tupiguarani and their relations with other groups, diachronic change, vessel functions, and ethnicity. They examine ceramic forms/morphologies, geometric decorations, and functionality. There are comparisons with proto-Guaraní, proto-Tupí, and Noroeste groups. They take a structuralist interpretation of social expression and examine indigenous philosophies, linguistic variations, territorial identities and distinct communities, and relationships of ceramics to body parts. The chapter citations are mostly in Spanish and Portuguese but the authors could benefit by looking at Brenda Bowser’s long-term research in Amazonian Ecuador.

Tamara L. Bray (Department of Anthropology, Wayne State University, Detroit, Michigan, USA/ EEUU) “Encuentros Imperiales: Contingencia Histórica, Agencia Local, e Hibridad” (pp. 59-74, 12 figures, 1 table, 81 references). The American scholar Tamara Bray focuses on agency theory in her analysis of provincial Late Period Inka ceramics from four sites in highland coastal Ecuador, comparing these locally produced materials with Inka state production. The previous researches by Rowe and Menzel are cited. There is a detailed discussion of morphological, functional, and stylistic variation accompanied by excellent illustrations. The concepts of agency, actors, and object hybridization figure into the presentation as does the work of Cathy Costin (2001).

María C. Páez, “De Presencias y Ausencias. Cambios y Continuidades en la Tecnología Alfarera de las Sociedades del Valle de Tafi” (pp. 75-85, 2 figures, 60 references). Late Period pottery production in the Tafi Valley of Argentina, especially the Cultura Santamariana, shows influences and practices borrowed from Inka ceramic production. Black/white, Black, Red/black, bi- and tricolor ceramic are detailed and paste analyses show a mixture of metamorphic, volcanic, and sedimentary origins. Concepts by Giddens (1984) and Lemonnier (1986) figure in the cultural analyses.

Guillermo A. De La Fuente, “Tinajas, Ollas y Yuros: Producción de Alfarería durante el Período Tardío (ca. AD 900 – AD 1200) en Watungasta (Departamento de Tinogasta, Catamarca, Argentina)” (pp. 87-100, 5 figures, 48 references). The site of Watungasta (Depto. De

Tinogasta, Provincia Catamarca) Argentina, is the subject of Late Period (900-1200 CE) pottery studies by De La Fuente. He employs ceramics recovered by surface survey and excavation in his *chaîne opératoire* analysis which is influenced by Dean Arnold's Peruvian ethnoarchaeological research as well as by Africanist scholars Gosselain, Livingstone Smith, and Barley. The organization of production, analysis of vessel forms (including funerary urns, and culinary vases and ollas), petrographic studies, the identification of technological traditions, and 47 kilns are documented. Nine characteristics of local production are discerned and detailed; Inka influences and conservative technologies are also reviewed. Costil (p. 87) should be Costin. Readers interested in his work should also read: "Urns, Bowls, and Ollas: Pottery-Making Practices and Technical Identity in the Southern Andes during the Late Period (ca. A. D. 900-A. D. 1450) (Catamarca, Northwestern Argentine Region, Argentina)," *Latin American Antiquity* 22(2):224-252 (2011). He writes: "The analysis of a large sample of ceramic sherds, complete vessels, and overfired sherds indicates that the potters produced a very narrow repertoire of ceramic forms (bowls, urns, and ollas) using local raw materials and technology, the latter with a strong hold in the area. Pottery production during the Late Period was carried out in household contexts, becoming increasingly intensified and concentrated with the appearance of Inkas in the region. Additionally, some ideas are discussed concerning the technological choices of ancient potters during this period, and the implications for technological studies in archaeological ceramics." See also: Lund Rasmussen, K., De La Fuente, G. A., Bond, A. D., Mathiesen, K. K., and Vera, S. D., "Pottery firing temperatures: a new method for determining the firing temperature of ceramics and burnt clay," *Journal of Archaeological Science* 39:1705-1716 (2012).

Marco Giovannetti (Departamento Científico de Arqueología, Museo de Ciencias Naturales, Universidad Nacional de La Plata – CONICET) and María C. Páez, "Las Prácticas Alfareras tras la Presencia Inkaica: Un Análisis a partir de los Platos del Noroeste Argentino" (pp. 101-112, 6 figures, 2 graphics, 1 table 34 references [not in alphabetical order]). The authors examine pottery from Late Period northern Argentina that has relationships to Inka state ceramics, particularly arybalos and funerary urns. The focus of their analysis is 44 specimens of ceramic plates, which have not been adequately studied. The essentials of Inka ceramic production are considered and plate variants detailed on the basis of border decorations and plate profiles.

Lidia C. García (Instituto de Arqueología, Facultad de Filosofía y Letras, Universidad Nacional de Buenos Aires – CONICET) "La Cerámica de Azul Pampa como Evidencia de Relaciones Sociales a Escala Comunitaria y Regional" (pp. 113-124, 6 figures, 3 appendices, 27 references). García discusses the microregion of Azul Pampa (provincial de Jujuy) in northeastern Argentina during the Late Period and Period of Regional Change. Her diachronic evaluation covers nine centuries (radiocarbon dates are presented, p. 115) and employs ceramic ethnoarchaeological concepts in reviewing the cultural continuity of certain vessel forms (small and large ollas, cantaros, jarras, virques, and ollas grandes). Form/morphology, decorations, and relationships to ceramics from Antigal Alto Sapagua and Pukara de Hornaditas are included.

Flavia V. Ottalagano (CONICET-Universidad Nacional de Rosario) "Análisis contextual del registro artístico del sitio A. Arenal 1 (Provincia de Entre Ríos, Argentina): aportes para el estudio de los aspectos identitarios de los grupos humanos del litoral fluvial del Paraná" (pp. 125-140, 11 figures, 33 references). The site of Arenal I (Rio Parana, Provincia de Entre Rios) Argentina is considered by the author in terms of ceramic vessel forms/morphology, and decorative types (especially symbols, motifs, and symmetry), as well as production practices. Variations in restricted and unrestricted vase forms led to determinations of ethnicity.

The editors are to be thanked for bringing this important monograph to this reviewer's attention. It is good to see a variety of papers on ceramic studies in southern South America and the types of analyses of archaeological ceramics and the social processes of Prehispanic societies with respect to cultural practices and especially the influences of the Inka on local and provincial production. The contributors show that ceramic research outside of the Inka is alive and well in southern South America and that many of the contributions employ paradigms and analytical methods from Latin American and Euro-American scholars.

Materials Issues in Art and Archaeology IX, Pamela B. Vandiver, Weidong Li, Jose Luis Ruvalcaba Sil, Chandra L. Reedy, and Lesley D. Frame (eds.), Materials Research Society Symposium Proceedings Series Volume 1319. Cambridge and New York: Cambridge University Press, 2011, 392 pp., 314 b/w illustrations, 9 color illustrations, 37 tables. ISBN 9781605112961, \$115.00 (hardcover). Cambridge (CUP) has taken over the publishing of all MRS symposia and the Proceedings are published in both print and electronic formats (see *MRS Online Proceedings Library* at <http://www.mrs.org/opl>) as

Volume 1319 of the Materials Research Society Symposium Proceedings Series.

The five distinguished editors are well-known in material science research, have participated in previous MRS symposia, and represent four nations: Vandiver (University of Arizona), Weidong (Shanghai Institute of Ceramics, Chinese Academy of Sciences), Ruvalcaba Sil (Universidad Nacional Autónoma de México), Reedy (University of Delaware), and Frame (Cardiff University). The volume is based on Symposium WW, "Materials Issues in Art and Archaeology IX," which was held November 29 through December 3 at the 2010 MRS Fall Meeting in Boston, Massachusetts. This symposium, like its predecessors, featured cutting-edge topics, interdisciplinary research, and innovative applications of traditional and novel analytical methods. Its focus is: 1) characterization of art objects and archaeological artifacts; 2) analysis and reconstruction of the technologies of selection, preparation, production, testing and performance by which materials are "produced and transformed into useful, significant and beautiful objects"; 3) studies of the properties and performance of ancient objects and the processes underlying their deterioration, preservation and conservation; and 4) the development of sensors, proxies and other tools and methods for evaluation of long-term stability, for non-destructive, in-situ examination and characterization, and for testing new methods and materials for conservation treatment. The preservation of cultural heritage includes developing a critical understanding of how ancient people developed, used and transferred technologies to solve problems of survival, organization and the making of objects that represent what was important to them. The 30 contributions by 30 authors have individual bibliographies and are divided into five parts: Part I. Ancient and Traditional Technologies: Analysis and Reconstruction (Chapters 1-11); Part II. Archaeological Science (Chapters 12-14); Part III. Conservation Science (Chapters 15-17); Part IV. Technical Art History (Chapters 18-22); Part V. Funding, Methodology and Instrumentation (Chapters 23-28); Part VI. Interdisciplinary or Cross-Disciplinary Contributions (Chapters 29-30). The focus of this review is on the ceramic-related chapters. The other contributions and their authors are listed after the reviews of the ceramic papers. Among the 30 papers, seven are on ceramic topics and are scattered through the volume. Vandiver and her colleagues have once again produced a splendid volume on many aspects of materials science, including ceramics.

Chapter 1: Paula Artal-Isbrand, Phillip Klaudmeyer, and Winifred Murray, "An evaluation of decorative

techniques on Red-figure Attic vase from the Worcester Art Museum using Reflectance Transformation Imaging (RTI) and Confocal Microscopy with a special focus on the 'relief line'" (pp. 3-33, 30 figures, 25 references). The technique used to produce black- and red-figure Greek Attic vases is ingenious and one of the milestones in the history of ceramic technology. Achieved through three stages of firing -- oxidation, reduction and re-oxidation -- this technique was lost after Antiquity and remained a mystery until its rediscovery less than a century ago. According to this ceramic tradition, the black portions on the vessel's surface are the painted sections. The "paint" used is technically a glaze or slip consisting of diluted silica-rich clay. The unpainted parts of the vessel reveal the natural red color of the fired clay body. Debate continues however on the techniques used to decorate the surfaces, in particular the one used to create the thin black relief lines that articulate the features within the figures. The Worcester Art Museum has in its collection a fragmentary red-figure stamnos attributed to the Tyszkiewicz painter and dated to c. 480 BCE, which displays an unusually wide repertoire of decorative surface features used by red-figure painters. One can observe broad black contour bands, which define the unpainted shapes of the red figures and constitute part of the black background. Within the figures, a variety of techniques are evident: thin relief lines depict faces, hair, body parts and folds in the garments; raised black dots represent curly hair or fancy trim on garments; faint brown lines suggest further details within the figures. The limited use of an applied dark red colorant is discernible in a few hair and clothing details, as well as in a partial inscription over the black background. Recessed unpainted lines are also visible under certain raking light conditions and served as a preliminary sketch to delineate the composition before commencing the painting process.

In 2007, the Worcester Art Museum Conservation Department acquired new equipment designed for Reflectance Transformation Imaging (RTI). This innovative surface imaging method uses a fixed light array, digital photography, computer software, and mathematical algorithms to create interactive, high-resolution digital files of surfaces as they appear under various angles of illumination. The resulting RTI images provide a two-dimensional representation of an object's intricate 3-dimensional surface topography. Using RTI, researchers can often discern surface features that are not readily visible with the naked eye or with traditional magnification techniques. This paper presents findings from recent RTI and confocal microscopy examinations of the decorative surface features on the Worcester stamnos, with a special focus on the debated black relief lines. These imaging tools offer a fresh look at Attic vase painting in hopes of better understanding how the object

is decorated, in what sequence it was painted, and what tools may have been used to do so.

Chapter 3: Leslie L. Frame, Donna Bright DeSorda, Yuan-Chi Chang, and Pamela Vandiver, "Methods of faience manufacture in antiquity: Investigation of colorants and technological processes" (pp. 43-54, 8 figures, 1 table, 24 references). Faience manufacture has been carefully categorized by others to include efflorescence, direct glaze application, and cementation glazing methods. These processing methods usually refer to traditional faience objects with ground quartz bodies and "glassy" exteriors. The present study examines both ancient and modern objects consisting of ground-quartz body faience figurines, faience-glazed steatite scarabs, and faience tubular beads. The objects analyzed include the faience collection at the Arizona State Museum in Tucson, AZ and a small collection of purchased modern faience and collected and donated faience from a variety of sites in Egypt and the Near East. The majority of the ancient samples date to the Hellenistic period. Whole objects were analyzed using non-destructive portable X-ray fluorescence, and samples were taken from a small selection of objects to examine cross-sections using a Hitachi S-3400N scanning electron microscope with energy dispersive spectroscopy. The use of modern replicas as comparative material have allowed the investigators to determine that the manufacture of glazed steatite beads does not always follow the traditional direct-glaze application technique, and have discovered some evidence for vapor deposition application to the carved stone trinkets. In addition, comparison to modern replicas has allowed the identification of some fakes and forgeries that had previously unknown historical status. Furthermore, this investigation of faience manufacturing methods has been placed in a larger context of glaze and glass technologies present in the ancient world with the goal of adding to our understanding of cross-craft relationships and the exchange of technological information among ancient craftspeople.

Chapter 4: MaryFran Heinsch, "Divergent pottery firing practices at the advent of the Early Bronze Age: The social integration of crafts and craftspeople at Kura-Araxes sites in the northeastern Caucasus" (pp. 55-66, 6 figures, 6 tables, 25 references). The beginnings of bronze metallurgy are frequently linked to the development of pottery kilns that offered greater control of temperature and atmosphere. It is because the pyrotechnologies involved in pottery making and metalworking are closely related, that similarly close social relationships between these crafts and craftspeople are often imagined. Yet, for a wide variety of reasons, the nature of these relationships is difficult to define. Direct

evidence for kilns, hearths and forges are frequently lacking, and associated remains of ceramic and metal production are exceptionally rare. Further, the transfer of pyrotechnical knowledge between craftspeople does not necessarily predict the adoption of these techniques in diverse production traditions. Likewise, the transition to bronze metallurgy in the northeastern Caucasus is sometimes difficult to gauge and inconsistently corroborated by ceramic evidence. Most ceramics from this period are of the Kura-Araxes type which dominated regional material assemblages as early as the mid fourth millennium B.C. and which are typically associated with the advent of arsenical bronze metal working elsewhere in the Caucasus. An important minority of the ceramics however, is Velikent Fine Ware. These appear to have been made on a wheel and more highly fired than the Kura-Araxes ware. This provoked speculation that Velikent Fine Ware might represent an intrusive production regime with connections to both ceramic and metallurgical traditions of Uruk sites to the south. In order to examine this likelihood and expose patterns of technical variation in their associated pyrotechnologies, a selection of both ceramic types from the sites of Velikent in Russia, and Serker-tepe in northern Azerbaijan were selected for analysis. Instrumental Neutron Activation Analysis was first conducted to assess their relative provenience and exclude the presence of imports. Xeroradiography and petrography produced information on clay textures and primary forming techniques relating to conservative elements of the ceramic production sequence. Finally, SEM-EDS of re-fired sherds and local clay soils, together with observations of ceramic color and markings provided estimates for firing temperature and atmosphere. The results reveal divergent finishing and firing practices within an otherwise unified production tradition and point to asymmetries in the social integration of crafts and craftspeople within and between Early Bronze Age communities in the Caucasus.

Chapter 8: Lan Zaho, Jianmin Miao, Bairui Yang, and He Li, "Nondestructive Raman study on the provenance and firing temperature of Guan Ware in the Song Dynasty" (pp. 95-101, 5 figures, 1 table, 5 references). Guan celadon is one of the most famous imperial porcelain in the Song dynasty (960-1276 AD). There are no more than 200 pieces left in the world. Non-destructive Raman analyses were performed on 32 pieces of Guan wares which were collected by the Palace museum, 12 museum collected copies in Ming and Qing dynasties and 15 sherds with known-ages from excavated kiln-sites. Raman spectra of the glassy phase network were discussed to find the compositions, firing temperature of the glaze. Raman peaks of the remained crystals such as quartz and feldspar gave information about jade-effect of

the glaze. According to the glassy features of the Raman spectra, the Guan wares were classified into two groups; those copies were in the third group. The classification is in agreement with the X-ray fluorescence data. The systemic studies on the shards give helpful clues to determine the provenance of the museum collections.

The development of the manufacturing techniques from Song to Qing Dynasty was also discussed.

Chapter 9: Catherine Dejoie, Pauline Martinetto, Eric Dooryh e, Ross Brown, Sylvie Blanc, Patrice Bordat, Pierre Strobel, Philippe Odier, Florence Porcher, Manuel Sanchez del Rio, Elsa Van Eslande, Philippe Walter, and Nichel Anne, "Diffusion of indigo molecules inside the Palygorskite clay channels" (pp. 103-115, 6 figures, 1 table, 42 references). The "Maya Blue" pigment (ca. 800 A.C.) is one of the most ancient organic-inorganic hybrids designed in the past; it is present on numerous frescoes and decorated objects of Mesoamerica. The good state of conservation of this pigment, in spite of hostile climatic conditions, held the attention of the scientists since 1960. The coloring agent was identified as indigo, confined in a particular porous clay matrix.

This hybrid pigment combines the color of the organic component with the chemical resistance, and the thermal and mechanical stabilities of the mineral. The structure of this organic-mineral composite and the indigo-clay interactions remain however controversial. Combining molecular dynamic simulations with new X-ray diffraction and thermogravimetric data, the authors propose a new model to explain the exceptional durability as well as the chemical stability of the archaeological pigment. The aim is then to mimic the high color stability of Maya Blue, by designing a new hybrid pigment. They succeeded in producing stable composite analogues, by inserting organic coloring agents (e.g. indigo) inside the cages and channels of appropriate aluminosilicates (e.g. zeolites). Lastly, they aim at understanding such nontoxic and durable hybrid pigments, as a possible solution for replacing faded and aged pigments on ancient painted artifacts.

Chapter 12: Philippe Sciau and Y. Leon, "Thin coatings of ceramics: Some new developments in France and Europe" (pp. 137-148, 5 figures, 68 references). Since more than a half a century, many archaeometric works have been devoted to the study of ancient ceramics with the aim to contribute to the reconstruction of their life cycle from production through distribution to use. The field of investigation is very large and includes an extensive historical period (from Neolithic to the present time), a wide range of analyzing techniques, and a wide range of objectives (provenance studies, manufacturing processes, identification of organic residues...). Also the

aim of this talk is not to give an exhaustive review of the studies carried out in Europe but rather to focus this presentation on the current developments in the physical examination of the ceramics, thanks to the new developments in instrumentation and material sciences. Particular attention will be given to the studies concerning the decorative ceramic thin coatings. These finishing coatings (glaze, gloss, and slip) make up the visible surface and define the final aspect of ceramics (color, brilliance, etc.). In fact, throughout the centuries, craftsmen's know-how has expressed itself by means of the realization of those thin decorative coatings. From those considerations, one can understand the importance of examining them, with all the modern means at our disposal, in order to discover how potters were able to produce such objects and thus help to improve our knowledge about the technological level attained by those societies. It is also a powerful means to follow the technological evolution or to investigate the link between contemporaneous communities or societies. The new archaeometric approaches are linked to the new advances in material sciences. However the relationship between archaeometry and material sciences is two-directional. It was shown that archaeometric results are increasingly interesting for materials sciences in particular in the elaboration of new materials or devices, or in the physical properties modeling. Finally, the major conferences that were taking place in Europe concerning ceramics were briefly presented.

Chapter 30: Weidong Li, Hongjie Luo, Xinmin Sun, Lanhua Liu, Xiaoke Lu, Zhiwen Zhao, and Musen Guo, "Microstructure and its physicochemical basis for the White porcelain from Gongyi kiln of Henan Province in China" (pp. 361-381, 8 figures, 1 table, 2 references). People generally thought the earliest white porcelain in China were the wares unearthed from Fancui tomb of Northern Qi dynasty (550-577 A.D.), but the archaeological excavation conducted at the Baihe kiln site in Gongyi county of Henan province from April 2005 to December 2007 denied this idea. Many green porcelain shards and a few white porcelain shards of Northern Wei dynasty (386-534 A.D.) were discovered in the fire box of No.2 kiln, which brought forward the invention time of white porcelain about one hundred years earlier than previously expected. The white porcelain shards and green porcelain shards were found in the same kiln, which implicated the evolution process from green porcelain to white porcelain in the Northern Wei Dynasty of China. In this study, the origin and development of Chinese white porcelain was taken as the main research subject. The unearthed porcelain shards of Northern Wei dynasty and Tang dynasty from Baihe kiln site were selected as research objects. Chemical composition,

firing temperature, microstructure, physical properties and chromaticity were studied using scientific means. The statistical analysis method was applied to analyze the experimental data to investigate the regularity of the origin and development of Chinese white porcelain. The results showed that white porcelain was derived from green porcelain on the basis of deliberate selection and disposal of raw materials, modification of body and glaze formulae, improvement of firing technologies, and unremitting practices. In the late Tang dynasty, the blue and white porcelain came into being based on the mature technology of white porcelain production.

The non-ceramic chapters are (Arabic numbers before the titles refer to chapter numbers): Part I. Ancient and Traditional Technologies: Analysis and Reconstruction. 2. "Metallography, microanalysis and corrosion of the Athlit Ram" by Michael Notis et al. 5. "The earliest bead manufacture in the Americas at the Paleo-Indian Jones-Miller site, Wray, Colorado" by Pamela Vandiver and Amy Vandiver Gruhl. 6. "Influence of the heat treatment on the physical transformations of flints used by Neolithic societies (western Mediterranean area)" by Josep Roqué-Rosell et al. 7. "The history and scientific analysis of pre-1856 eastern woodlands quillwork dyes" by Christina Cole. 10. "Beyond the word: ink in the Islamic manuscripts of northern Nigeria" by Michaëlle Biddle. 11. "Technological tradition and change in Tibetan silversmithing techniques in Songpan, Sichuan Province, China" by Chandra Reedy. Part II. Archaeological Science: 13. "The early Iron Age metal workshop at Tell Tayinat, Turkey" by Jim Roames. 14. "Alloys from Anau: the manipulation of metallic properties in third millennium B.C. southern central Asia" by Nathaniel Erb-Satullo. Part III. Conservation Science: 15. "Non-invasive characterization for long-term preservation of cultural heritage" by Fenella France. 16. "Preliminary results of the use of hydroxyapatite as a consolidant for carbonate stones" by Enrico Sassoni et al. 17. "Research on the corrosion of bronze weapons from the pits of the terracotta warriors" by Xiaomei Zhang et al. 18. "Structural degradation of third millennium B.C.E. archaeological wood from Shahr-i Sukhta, Iran" by Mohsen Mohammadi Achachluei and Gholamreza Vatankhah. Part IV. Technical Art History: 19. "The redecoration history of a Chinese polychromed guanyin attributed to the 11th–12th century C.E. as deduced from stratigraphic microanalysis" by John Twilley and Kathleen Garland. 20. "Non-destructive study of the independence act of the Mexican empire of 1821" by Jose Luis Ruvalcaba-Sil et al. 21. Space heritage: the Apollo heat shield, atmospheric reentry, imprint on materials' surface" by Hanna Szczepanowska and Thomas G. Mathia. 22.

"Deterioration in abstract expressionist paintings: analysis of zinc oxide paint layers in works from the collection of the Hirshhorn Museum and Sculpture Garden, Smithsonian Institution" by Christopher Maines et al. Part V. Funding, Methodology and Instrumentation: 23. "Science at the interface with art" by Lynnette D. Madsen et al. 24. "Ultrafast laser cleaning of daguerreotypes" by Michael J. Abere, Ryan D. Murphy, et al. 25. "Seeing through corrosion: using micro-focus x-ray computed tomography and neutron computed tomography to digitally 'clean' ancient bronze coins" by Hai-Yen Nguyen et al. 26. "Dinosaur and crocodile fossils from the Mesozoic of Portugal: neutron tomography and synchrotron-radiation based micro-computed tomography" by Rui M. S. Martins et al. 27. "Preparation and assessment of superhydrophobic organic-inorganic hybrid coatings for conservation of Yungang grottoes" by Shaojun Liu et al. 28. "Interim report on 'the lightfastness correlation project'" by Mark Gottsegen. Part VI. Interdisciplinary or Cross-Disciplinary Contributions: 29. "Reconstructing the past to prevent future loss: the dyeing industry of Pompeii" by Heather J. Hopkins.

Potters and Communities of Practice: Glaze Paint and Polychrome Pottery in the American Southwest, AD 1250 to 1700. Linda S. Cordell and Judith A. Habicht-Mauche (eds.), Anthropological Paper 75. Tucson: University of Arizona Press, 2012. xi + 194 pp., ISBN 978-0-8165-2992-6, \$19.95 (paper).

At the 2002 Society for American Archaeology annual meeting, Habicht-Mauche, and others organized a symposium on "The Social Life of Pots" that was subsequently published as *The Social Life of Pots: Glaze Wares and Cultural Dynamics in the American Southwest AD 1250-1680*, Judith A. Habicht-Mauche, Suzanne L. Eckert, and Deborah L. Huntley (eds.), Tucson: University of Arizona Press, 2006 (reviewed in the *SAS Bulletin* 29(4):23 (Winter 2006)). The present volume, a follow-up to the 2002 symposium and 2006 book, contains 14 of 15 revised and expanded papers and the discussion presented at the annual meeting of the Society for American Archaeology in April 2009. This work grew out of discussions fostered by that book and, like its predecessor, the 2012 volume is a mixture of research conducted by graduate students, scholars who recently obtained their doctorates, and more experienced archaeologists. The 2012 volume differs, however, in that nearly all of the contributions are collaborative efforts by researchers from different institutions, sharing data, and providing insights gained from different analytical techniques and perspectives – the resulting chapters are, as the editors point out "working papers" (p.

xi and p. 1). The contributors to this volume present results of their research on the production and distribution of these new wares, including cutting-edge chemical and petrographic analyses. They also employ the insights gained to reflect on the changing nature of communities of potters as they participated in the dynamic social conditions of their world. The peoples of the American Southwest during the 13th through the 17th centuries witnessed dramatic changes in settlement size, exchange relationships, ideology, social organization, and migrations that included those of the first European settlers. Simultaneously with these “earthshaking events, groups of potters began producing new kinds of wares -- particularly polychrome and glaze-paint decorated pottery -- that necessitated new technologies and new materials. The contributors to this volume present results of their collaborative research into the production and distribution of these new wares, including chemical and petrographic analyses. They use these insights gained to reflect upon the changing nature of communities of potters as they participated in the dynamic sociopolitical conditions of their cultures.

Linda Cordell, who passed away on 29 March 2013 (see www.santafe.edu/news/item/linda-cordell-obit/ and www.santafenewmexican.com/news/local_news/article_48c218ab-ee13-54fa-ae0c-620157ee619b.html) had been a senior scholar at the School of American Research (SAR) since 2006, and had served as Chair of the University of New Mexico Department of Anthropology, as curator at the California Academy of Sciences, was appointed Director of the University of Colorado Museum and was Professor Emerita of Anthropology at the University of Colorado. She was elected to the American Academy of Arts and Sciences and the National Academy of Sciences, and was awarded the A. V. Kidder medal for eminence in American Archaeology by the American Anthropological Association. Judith Habicht-Mauche is a Professor of Anthropology at the University of California, Santa Cruz, where she has been a member of the faculty since 1990. She received her doctorate from Harvard University and received training in ceramic materials analysis at the Center for Materials Research in Archaeology and Ethnography (CMRAE) at MIT. She is regarded as an expert in the archaeological application of mineralogical, chemical, and isotopic techniques for sourcing artifacts and reconstructing ancient trade routes, with a specialization in ceramic analysis for the American Southwest. In 2009 she received the “Award for Excellence in Archaeological Analysis” from the Society for American Archaeology in recognition of her contributions to the study of archaeological ceramics.

The current volume contains a “Preface” (p. xi), 15 chapters, and a conflated set of “References” with 637 entries (pp.155-184), a triple-column “Index”-- proper noun and topical (pp. 185-192), and volume “Abstract/Resumen” (p. 193). In their own essays, the authors reference the other contributions to this volume. The individual chapters are summarized as follows. 1. “Practice theory and social dynamics among the Prehispanic and Colonial communities in the American Southwest” by Linda S. Cordell and Judith Habicht-Mauche (pp. 1-7). The editors’ note that the contributors use archival materials, ethnography, and archaeology in their presentations and employ a variety of archaeological, anthropological, ethnographic, and experimental methods in order to reconstruct the techniques, technologies, and styles that characterize specific local and regional cultural traditions of glaze-painting and polychrome decoration of ceramics in the Greater Southwest. They provide the reader with a brief overview of the period, prior major research related to tracing the fabrication of vessels and their movement across the landscape, and in their review of essays and themes point out that the chapters are clustered into three chronological groups: 1) origins of ceramic traditions (Chapters 2-4); 2) case studies concerned with the spread of traditions (Chapters 5-10); and 3) contributions that focus on the “end of production” during the Spanish colonial period and the before and after the Pueblo Revolt of 1680 (Chapters 11-14).

2. “Embedded networks? Pigments and long-distance procurement strategies in the Late Prehispanic Southwest” by Deborah L. Huntley, Thomas Fenn, Judith Habicht-Mauche, and Barbara J. Mills (pp. 8-18, 6 figures, 1 table). The authors focus on the contexts of glaze ware production and use, recipes and raw material sourcing, and procurement networks. There is a brief discussion of the foundations for the analyses of glaze paint and pigments, notably, MAT ELEMENT, Hr ICP-MS, and MC-ICP-MS, as well as the “older technologies” of ICP-MS and TIMS. Lead ore isotopic analyses are presented for Arizona and New Mexico, Arizona glaze paints, Zuni glaze paints, and separately for glaze paints from the north and central Rio Grande and southern Rio Grande regions. Spatial scales of lead ore use for glaze decorated pottery differentiate the Eastern from Western Pueblos. Two kinds of practices are identified in this very significant synthesis of research: 1) ore procurement and 2) the creation of paints from the raw ores. Concepts of the “community of practice” (Wenger 1990, 1998) and technological styles figure into their interpretations. 3. “A community of practice in diaspora: the rise and demise of Roosevelt Red Ware” by Patrick D. Lyons and Jeffrey J. Clark (pp. 19-33, 3 figures, 1 table). Lyons and

Clark consider Salado ceramic production, ancient migrations, diaspora, Salado as the Kayenta in diaspora, learning theory, and communities of practice, and the rise and fall of Roosevelt Red Ware production in their essay. Table 3.1 provides relevant detailed data on 14 wares and the authors use a dispersal and diaspora paradigm as well as practice theory, and situated learning theory (apprenticeship modeling) in their examination of the dispersal of Red Ware; they conclude that the Red Ware tradition was maintained over space and time, contra Patricia Crown (2004).

4. "The northwest Mexican polychrome tradition" by David J. Phillips, Jr. (pp. 34-44, 6 figures 1 table). Phillips discusses *habitus*, cannons, and learning theory and practice (Bourdieu 1977, 1990) in his contribution. The chronological framework for Casas Grandes culture is revised into four units spanning pre-600 to 1450 AD and two separate polychrome traditions for northwest Mexico, Casas Grandes and Trincheras, are detailed. Paint recipes and rules for painting are determined and he notes that the ancient roots for Pueblo IV polychromes may possibly lie in Mimbres culture or even Mesoamerica.

Chapters 5 through 10 are case studies. 5. "Polychrome pottery of the Hopi mesas" by Dennis Gilpin and Kelley Hays-Gilpin (pp. 45-54, 2 figures, 1 table). The authors provide a brief background on the Hopi, the changing array of migrations, and characterize the beginnings of bichrome painting leading into polychrome production and a diversification of that style of pottery. Communities of practice per se do not figure into their explanations of data on their regional analysis of "communities of potters" (rather than communities of practice because of the lack of detail in order to assess motor patterns). They consider the beginning of Yellow Ware (ca. AD 1300) and Sikyatki Polychrome (1350), focusing on its debut, styles, and motifs on pottery and kivas (and likely textiles that have not survived). Lastly, they review the decline of Sikyatki and the rise of San Bernardo Polychrome.

6. "Choosing clays and painting pots in the fourteenth-century Zuni region" by Suzanne L. Eckert (pp. 55-64, 5 figures). Eckert examines the development of Zuni Glaze Ware polychromes, noting that although there is little difference in vessel size, technological and compositional attributes, designs, external slip color, and regional distribution, there are dramatic differences in interior slip colors. Hence, she believes that there are two communities of identity within a single community of practice. Analyses of paste composition by INAA and studies of lead and copper oxides by electron microprobe confirm this assessment. Practice theory and learning

theory lead her to the conclusion that there is a shared community of identity among two groups of recent migrants.

7. "On-ramps to the Glaze Ware interstate: Ceramic trade at Pottery Mound pueblo and Montañito Bridge pueblo, New Mexico" by Hayward H. Franklin and Kari L. Schleher (pp. 65-74, 1 figure, 4 tables). Northern Rio Grande Glaze Ware from the two pueblos during the Classic period (AD 1300-1500) is the focus of this research to identify origins and the exchange of finished pottery vessels. The two sites (PM and MB) are 72 km apart and are contemporary based on dendrochronological and AMS radiocarbon studies. Glazes A through D were assessed within the assemblage of 38,500 sherds at PM and 15,000 sherds from MB. Ceramic production during the Classic period had six characteristics which the authors detail. There were 94 imported sherds at PM and 3,628 at MB (much of the latter were utilitarian wares from the Galisteo and Tijeras areas). The authors also calculate distances in km and miles between Pottery Mound glazes types and affinities to nine modern communities. They note that while importation can be calculated, exportation from the two sites is unknown.

8. "The right ingredients: Southern Cerrillos Hills lead paint on Pajarito Plateau-produced Glaze-painted pottery" by Diane Curewitz and Sheila Goff (pp. 75-84, 4 figures, 2 tables). The authors are the first to provide petrographic and ICP-MS lead isotope glaze data for ceramics from the Pajarito Plateau, New Mexico, in their study of production and exchange in the middle Rio Grande region during the Classic period – a time of great change. They discuss the geology of the plateau and the importance of sourcing the lead paint prior to an analysis of Glazes A through E, concluding that the Cerrillos Hills (60-80 km distant) was the source of choice in spite of closer lead resources. Rio Grande Glaze Paint Ware is seen as an integrative element during Classic period social reorganization.

9. "Cieneguilla Glaze-on-yellow temporal measurement and learning traditions at San Marcos pueblo, north-central New Mexico" by Ann F. Ramenofsky (pp. 85-96, 6 figures, 3 tables). Practice theory, learning theory networks, and embedded social meaning figure in this essay which uses frequency seriation on pottery recovered from 20 middens at San Marcos. Cross-dating via dendrochronology differentiates glaze types, and taphonomic processes are also considered. She postulates a "gatekeeper" model regarding access to lead from the Cerrillos Hills source and concludes that Cieneguilla Glaze-on-yellow pottery was produced across the entire

region but that there were different temporal distributions at San Marcos that other glaze paint types.

10. “Glaze-over: Composition of Northern Rio Grande glaze ware paints from the San Marcos pueblo” by Kari L. Schleher, Deborah J. Huntley, and Cynthia L. Herhan (pp. 97-106, 7 figures 6 tables). The authors provide appropriate background to their study which seeks to determine if changes occurred in standardization over time. The report previous ICP-MS work prior to their electron microprobe analyses of Glazes A through F to discern glaze paint recipes during the Classic period (Pueblo IV). Sixty-seven sherds were analyzed: lead predominated with alumina, manganese and silica (these four accounted for at least 91% of the composition of all glazes). Using PCA and CV analyses, they conclude that there was a relative stability in the basic glaze components with only minor diachronic change and that colorants were not intentionally added.

The following four chapters focus on the demise of the glaze-paint tradition. 11. “Making a glaze: Multiple approaches to understanding Rio Grande Glaze Paint technology” by Eric Blinman, Kari L. Schleher, Tom Dickerson, Cynthia L. Herhan, and Ibrahim Gundiler (pp. 107-116, 7 figures). The authors provide a brief review of previous studies beginning with Kidder (1915) and Shepard (1942), comment on the lack of ethnographic models for the production of Rio Grande Glaze Paint Ware, and the need for experiment and replication studies. The ware has a consistency in appearance and composition in the region and their research focuses on differences in the use of pure galena (the precursor of mineral for glaze pigment), versus powdered galena or roasted galena for pigments. Archaeological research at Pueblo San Lazaro Building I yielded firing features and a platform for glaze ware firing. The authors employed SEM and created ceramic test tiles in their examination of the glaze technology. Roasted galena produces lead oxide although colorant issues remain and notable changes from the 17th and early 18th century include a “runny” glaze that they correlate with Spanish colonial expansion and lead mining. 12. “Through the glass darkly: The decline and fall of pueblo glaze ware traditions” by David H. Snow (pp. 117-126, 3 figures). The collapse of New Mexican Pueblo glaze-paint ceramics after a 400 year tradition is the center of Snow’s analysis. He employs surviving pre- and post-Pueblo Revolt historical documents in the examination of communities of glaze practice along with archaeological and glaze data. Glazes A through F were studied (A through D were pre-Hispanic, while E and F are chronologically within Spanish colonial era). There was a Spanish colony in the Rio Grande Valley of New Mexico

as early as 1598 and he looks at data from 1626 and ca. 1700; the same two lead mines are in use during both years but the number of villages declines from 24 to 7. The use of Pueblo men as military auxiliaries against Southern Plains Apaches and Navajos is related to shortage of lead shot and powder among the Spanish. The Spanish control of the mines, a church mission versus state struggle over the natives, village abandonment, and the relocation of refugees correlates with changes in the technology for preparation of tempering materials and resulting “runny” glaze. He argues that the lack of traditional sources of lead from the Rio Grande and other supplies and a lack of apprentice potters resulted in the fading of technological knowledge among the potters and memory of the original recipes.

13. “Mineral wealth and value: Tracing the impact of early Spanish colonial mining on Puebloan pigment and glaze production” by Noah Thomas (pp. 127-136, 3 figures). Thomas examines the interactions between two communities of practice, the Spanish miners and Pueblo pigment procurers from AD 1598-1600, using archival *entrada* documents and archaeological data from the pueblo of Paa-ko (site LA 162), a smelting-metallurgical workshop. The appropriation of mineral resources by the Spanish, the significance of red and black colored ores and blue-green minerals (color as indicative of Puebloan identity versus Spanish ore processing and copper metallurgy), and ore procurement changes are reviewed. Another transformation is the Prehispanic use of wood for fuel, with charcoal-production technology and forced draft kilns and metallurgical furnaces introduced in the Spanish era. Petrographic, SEM-EDS, and XRF data are presented on the copper, lead, and zinc ores as well as lead slag. Pueblo resource knowledge and Spanish ore processing practices hybridized and there was conflict between missionization and commodification during the pots-Pueblo Revolt period. 14. “Glaze-paint colono wares: Continuity or innovation?” by Jennifer Boyd Dyer (pp. 137-148, 8 figures, 5 tables). This chapter expands on Dyer’s 2010 University of New Mexico dissertation. She briefly reviews the production of colonoware in the Spanish Empire and quickly focuses on New Mexico ware and that Pueblo potters adopted new, Spanish-inspired vessel forms known as colonoware (soup plates, candlesticks, and teacups). Dyer poses three questions and proceeds to answer these: 1) the issue of technological continuity versus change in glaze-painted ceramics, 2) was the technology of glaze-painted colonoware as different as their morphology, and 3) what was the range of variability in glaze-paint colonoware production. Pre-contact Glazes C and D are compared with colonial era Glazes D and F; five temper types and five pueblos are considered (San Marcos, Galisteo, Pecos,

Yunque, and Rio Arriba), with an emphasis on soup plates. Data on the compositional analysis of 340 thin sections and macroscopic assessment of 643 rim sherds are reviewed. 15. "Thinking about pottery practice as community practice" by Rosemary A. Joyce (pp. 147-154). Joyce provides an insightful assessment of the preceding papers, discussing the community of practice and situated learning (Lave and Wegner 1991) and the concept of legitimate peripheral participation. Likewise, constellations of practices, traditions, innovation, and *habitus* are reviewed (Bourdieu (1977)). As seen, there were significant changes in the colonial period. She advocated avenues for future debates and the use of scientific analyses in concert with social theory.

Ceramic production is both a complex and conservative technology, particularly the alchemy of firing. In this incredibly important monograph, which focuses on the American Southwest in Prehispanic and colonial periods, we find a blending of social theory (notably communities of practice, practice theory, learning theory, etc.) as well as the scientific analysis of ceramic materials (petrography, INAA, SEM, SEM-EDS, microprobe, etc.) accompanied by data from archaeological excavations and extant colonial-era archival documents. Seven contributions (Chapters 2-8) employ the concept of communities of practice (Wenger 1998) and six utilize learning or practice theory (Chapters 3-6 and 9 and 10), while nine depend heavily on compositional analysis (Chapters 2, 6-8, and 10-14), so that Joyce's comment on needing to integrate social theory and technical analyses is appropriate. Petrographic thin-section studies and ICP-MS are alive and well. Etienne Wenger (*Communities of Practice: Learning, Meaning, and Identity*. Cambridge: Cambridge University Press, 1998) is a highly recognized theoretician in the field of social learning theory, communities of practice, and their application to organizations. Miriam Stark used the concept in "Glaze ware technology, the social lives of pots, and communities of practice in the late prehistoric Southwest," in *The Social Life of Pots: Glaze Wares and Cultural Dynamics in the American Southwest AD 1250-1680*, J. A. Habicht-Mauche, S. L. Eckert, and D. L. Huntley (eds.), Tucson: University of Arizona Press, pp. 17-33 (2006) and a few archaeologists have also employed it: T. J. Braje, *Neighboring Communities of Practice: a Case Study of Classic Stallings Ware Pottery*. Unpublished M.A. thesis. University of Florida, Gainesville (2004) <http://etd.fcla.edu/UF/UFE0000943/> and S. Kohring "Social Complexity as a Multi-Scalar Concept: Pottery Technologies, 'Communities of Practice' and the Bell Beaker Phenomenon," *Norwegian Archaeological Review* 44(2): 145-163(2011) <http://www.tandfonline.com/doi/full/10.1080/00293652.2>

[011.629811](http://www.tandfonline.com/doi/full/10.1080/00293652.2) In spite of a broad following in knowledge and business management, there are some cautionary tales: J. Roberts "Limits to Communities of Practice" *Journal of Management Studies* 43(3):623-639 (2006) http://www.academia.edu/357755/Limits_to_Communities_of_Practice and S. J. Kerno, Jr. "Limitations of Communities of Practice: A Consideration of Unresolved Issues and Difficulties in the Approach." *Journal of Leadership & Organizational Studies* 15(1):69-78 (2008).

Ceramics in America 2012, Robert Hunter (ed.), Milwaukee, WI: The Chipstone Foundation, distributed by the University Press of New England. xii + 196 pp., color illustrations, ISBN-10: 0982772203, ISBN-13: 978-0982772201, \$ 65.00 (hardcover).

Ceramics in America is an annual interdisciplinary journal distributed by the University Press of New England and intended for collectors, historical archaeologists, curators, decorative arts students, social historians, and contemporary studio potters. Now in its twelfth year of publication, it is considered the journal of record for historical ceramic scholarship in the American context. The editor, Robert Hunter, is a fellow of the Society of Antiquaries of London and an archaeologist and ceramic historian living in Williamsburg, Virginia. Following an "Editorial Statement" and "Introduction" (pp. ix-xii), both authored by Hunter, there are nine articles and five book reviews edited by Amy Earls plus a useful "Index" (pp.186-194). Previous annuals had a section entitled "New Discoveries" but this has now been discontinued but accessible on the *Ceramics in America* Facebook page. Several chapters review work on archaeological specimens and Kingsley et al. employed ICPS and NAA in their analyses. Overall, Hunter has again produced another splendid annual volume.

"Late Nineteenth and Early Twentieth Century Japanese Domestic Wares from British Columbia" by Douglas E. Ross (pp. 2-29, 35 figures [most in color], 7 tables, 51 endnotes). Little scholarly attention has been paid to industrially-produced domestic Japanese ceramics of this era, while Chinese pottery for this period has been reported extensively in detailed monographs. How the Japanese products came to North American domestic sites is the subject of Ross's chapter, an analysis of a single assemblage recovered on Don Island in the Fraser River of British Columbia, 20 km southeast of Vancouver. This is the subject of Ross's dissertation at Simon Fraser University (2009) and is summarized in this article. The ceramic materials are associated with a salmon cannery that operated from 1885 to 1930 and employed many

Japanese nationals. There is a brief history of Japanese porcelain of the Tokugawa period, underglaze blue, the impact of the Meiji period, and related technological changes (Table 1, 1869-1946), notably, plaster casting, stenciling transfer printing, the use of jiggers, and coal-fired kilns. Ross analyzed 1,738 sherds and 294 vessels, noting that stencil wares and transfer wares predominate in the assemblage and are related to serving tea and tea and sake. He details 13 vessel forming techniques, nine of which are found in the materials studied. Stoneware mortar bowls and sake bottles, celadon, and porcelain and semi-porcelain were also recovered. Design elements and motifs (eight themes predominate), maker's marks, and the dating of the assemblage are also considered in this seminal article.

"Early Chinese Porcelain Found in Panama" by Linda Rosenfeld Pomper (pp. 30-38, 16 color figures, 15 endnotes). Archaeological data on 16th- and 17th-century Chinese ceramics from Panama informs the reader about the importation of these wares and their effects on local taste, fashion, and aesthetics. The first Manila to Acapulco galleon, Mexico arrived in 1565 and large shipment date onward from 1573 so that Chinese porcelains soon found their way to Panamá la Vieja, which was destroyed by fire in 1671 and not reoccupied. The author details blue-and-white ceramics, late Ming kraak porcelain (a major import), and hard-paste porcelains found in recent excavations. There was a very early "use and ownership" of Chinese porcelains in the Spanish colonies, and was abundant in the House of the Genoese, a slave trade headquarters built during the early 1600s.

"History of Baltimore Porcelain" by Barbara and Ken Beem (pp. 39-66, 52 color figures, 30 endnotes). Baltimore, Maryland is an often neglected pottery production center in eastern North America. This chapter focuses on blue and grey salt-glazed stoneware, molded earthenwares, and a wide range of porcelain products produced by Edwin Bennett (born 1818 in Newhall, Derbyshire) and David Francis Haynes (born in Brookfield, MA in 1835). Bennett migrated to America in 1841, apprenticed in Ohio, Indiana, and Pittsburgh, and began potting in East Baltimore, Maryland by 1847, producing colored stoneware and majolica. Haynes traveled to Staffordshire returned to America and ultimately founded the Chesapeake Pottery establishment in South Baltimore, making hard-paste porcelain (known then as "white gold"). Haynes fell on hard times and purchased Bennett's pottery in 1887, renaming it the Edward Bennett Pottery Company in 1890. The focus thereafter was on utilitarian earthenwares but neither potter used makers' marks extensively so that there are

many "unsigned" products. This is complicated by the fact that neither potter maintained catalogs so that it difficult to determine where some of Bennett's ceramics were actually made and when. The products and their dating is the subject of the Beem's article, and they document creamers, pitcher, decorative flowers, and plaques of the 1800s.

"New Perspectives on Chinese Export Blue-and-White Canton Porcelain by Leslie Warwick and Peter Warwick (pp. 61-76, 18 figures [mostly color], 60 endnotes). Blue-and white Chinese-made porcelain tablewares, commonly called "Canton" ceramics, are the subject of the analysis with emphasis on the motifs employed by the Chinese painters. The authors provide a history of Canton production (1785-1835). The United States became the largest importer of Chinese ceramics after 1785 due to England's embargo of Chinese goods in 1790. The imports were a practical alternative to local glazed redwares and pewter because both were toxic due to high lead content and were also inexpensive. The sources of the images applied to Canton wares were scrolls or paper drawings, notably landscape paintings. The importance of rocks, trees, orchids, and structures (especially bridges, pagodas, and pavilions) is detailed and the Warwick's note that the depicted landscapes "do not try to replicate nature but represent the painter's heart and mind, conveying 'spirit.'" *The Mustard Seed Manual of Painting* (1679-1701) is determined to be the source of motifs selected by the artisans.

"Ceramics from the Tortugas Shipwreck: A Spanish Navio of the 1622 Tierra Firme Fleet" by Sean Kingsley, Ellen Gerth, and Michael Hughes (pp. 77-97, 23 figures [mostly color], 30 endnotes). This fleet, which included the "treasure ships" *Nuestra Señora de Atocha* and *Santa Margarita*, was destroyed in a hurricane on September 5, 1622, has been located and underwater robotic archaeological excavations undertaken in 1990-1991. Associated with these ships was another ship, now identified as *El Buen Jesús y Nuestra Señora del Rosario* that provided a remarkable ceramic assemblage rather than treasure. A total of 16,903 artifacts were recovered, including at least 209 olive jars (Goggin's Types 1, 2, 3, and 4), some with sgraffito marks. The authors compare the olive jars with other collections and also discern Seville blue-on-blue majolica tablewares (plates and bowls), Blue-and-white talavera, Seville white, and Columbia plain ceramics as well as Morisco wares and Red earthenwares. George Avery's dissertation, *Pots as Packaging: The Spanish Olive Jar and Andalusian Transatlantic Commercial Activities, 16th-18th Centuries* (University of Florida, 1997) provided basic data but the current report employs ICPS on clay

fabrics and NAA and statistics (PCA and DA) in defining chemical groups and chronologies. Their subsequent research traced the polychrome tin-glazed earthenware that was recovered to production sites in Spanish Andalusia. Other material was also Iberian in origin and they also identified Southern Atlantic/Circum-Caribbean Colonoware cooking vessels made in the New World in the assemblage.

“Ceramics from the 1813 Prize Brig *Ann*, Auctioned in Salem, Massachusetts: An Analysis” by George L. Miller (pp. 98-110, 5 color figures, 8 tables, 12 endnotes). George Miller has done it again – a splendid, well-documented piece of research combining archival and artifactual data. In April 1813 the British brig *Ann* was seized by an American privateer *Growler*, and its contents auctioned in Salem on April 13, 1813. A portion of the cargo included 250 crates of “Liverpool Ware,” a ceramic known previously only from written records, and seven cases of “Irish Linens.” There were four “basic assortments” of ceramics and Miller provides color images of the auction catalog and detailed analyses of crates 1, 51, and 131, and a summary of the assemblage of 109,240 ceramic vessels packed in the 250 crates. He calculated percentages by ceramic type (plates, dishes, bowls, mugs, cups and saucers, teawares, jugs, and table-serving wares; types of decoration are also elaborated: cream-colored, green edge, blue edge, painted, enameled, and “fancy” (dipped) wares. The catalog provides amounts requested in £ (Pounds Sterling in 1813) and Miller provides a conversion to American currency, again for 1813. The value of the ceramics was £1,300 (\$5,567) but the textiles were valued at £5,543 (\$25,333) – I rounded these numbers. Unfortunately the actual sales figures were not published in 1813 and so the actual value realized us not known. One of the other major revelations is evidence of the volume of common ceramic wares that were being produced in British potteries for export to American consumers even during the War of 1812 period.

“Stone-Ware of Excellent Quality, Alexandria Manufacture: Part I: The Pottery of John Swann” by Barbara H. Magid (pp. 111-145, 43 color figures, 12 endnotes). This chapter is the first of two parts that document the life history and production of John Swann, born in St. Mary’s County, Maryland, who began potting at the age of 14 in 1803. He worked at the Wilkes Street Pottery in Alexandria, Virginia from 1810 to 1825. Households of the day used English and German stonewares, but the Alexandria products were competitive and fabricated in five decorative types: an iron wash on the upper portion of the vessel, “sparsely” brush cobalt on the vessel exterior (usually floral and foliate designs), “more exuberantly” brushed cobalt, slip-trailed, and

undecorated. Data from archaeological excavations on the Wilkes Street site in 1977 and archival records suggested eight vessel forms: cake pots and butter pots, chamber pots, churns, jars, jugs, milk pans, pitchers, and portable earthen furnaces. There are no recognizable fragments of the furnaces at the kiln site or in other excavation in Alexandria. The use of pottery stamps and other decoration are also described. “The Stoneware of Early Albany: A Mystery Solved” by Warren F. Hartmann (pp. 146-154, 17 color figures, 1 endnote). The absence of unsigned and undated ceramics in Albany has been a problem for historical archaeologists, but the author’s provides careful documentation of the life and pottery products made by William Capron (1763-1838). The research suggests that storage pots and jugs can be attributed to Capron and wares marked “Albany/Ware” can also be attributed to this potter. “Paul Cushman: The Premier Albany Potter and His Stoneware” by Paul Cushman (pp. 155-170, 24 color figures, 5 endnotes). This chapter, researched and written by the potter’s grandson who bears the same name, focused on a better-known Albany pottery (1767-1832). Cushman made homogeneous dark grey stoneware that could also be blotchy or mottled, in three basic vessel forms: jars, jugs, and crocks. Some examples were grey with a cobalt wash applied over the maker’s stamped mark. He also produced pitchers, coolers, and special objects that were decorated as commemorative pieces or commissioned as presentation pieces. The pottery workshop was sold a year after his death.

The five book reviews include: Aileen Dawson, *English and Irish Delftware, 1570-1840*, London: British Museum Press, 2010, reviewed by Robert Hunter, pp. 171-173. Robert Findlay, *The Pilgrim Pit: Cultures of Porcelain in World History*, Berkeley: University of California Press, 2010, reviewed by Christiaan Jörg, pp. 173-176. Wally David and Helen Walker, *The Harlow Pottery Industries*, Occasional Paper 3, London: Medieval Pottery Research Group and English Heritage, 2010, reviewed by Silas Hurry, pp. 176-178; the late Alan Vince contributed technical analyses and ICO-AES and ICP-MS results are presented in appendices. Gordon W. Elliott, *Aspects of Ceramic History*, Endon, Staffordshire: G. W. E. Publications, 2010, reviewed by Mark Shapiro, pp. 179-181. And lastly, Lois Roberts, *Dated in Blue: Underglaze Blue Painted Earthenware, 1777 to 1800*, Wales: Gomer Press, 2011, reviewed by Jillian Galle, pp. 181-185.

Journal of Roman Pottery Studies Volume 15, Steve Willis (ed.). Oxford and Oakville, CT: Oxbow Books for

The Study Group for Roman Pottery, 2012. 288 pp., 165 b/w + col illus., ISBN 9781842175002, \$90.00 (paper).

The Study Group for Roman Pottery (SGRP) was formed in 1971 to further the study of pottery of the Roman period in Britain. It provides a forum for the presentation and discussion of the latest research, and of issues affecting the subject and its practitioners. The annual conference and regional meetings promote contact between specialists and the opportunity to handle pottery from different regions. The Group maintains an Internet site at <http://www.romanpotterystudy.org> The *Journal of Roman Pottery Studies (JRPS)* began in 1986 as a modest 79-page publication with five articles; subsequent issues contained upwards of a dozen articles, but beginning with the seventh publication in 1997, there has been a trend toward whole number thematic issue. This volume of *JRPS* published in later 2012, carries a broad range of papers reflecting the detailed ongoing scholarship in the field of Roman pottery studies. There is a marked international dimension to the eleven papers. This issue also includes an editorial, six book reviews, and obituaries. Each contribution has its own bibliography and is accompanied by splendid illustrations. Three of the essays concern pottery kilns.

1. "Beyond the confines of empire: A reassessment of the Roman coarse wares from Traprain Law" by Louisa Campbell (pp. 1-25, 23 figures, 7 in color). This contribution focuses on Roman objects in non-Roman contexts in northern Britain, especially the Scottish lowlands, and was the subject of Campbell's unpublished 2010 Ph.D. thesis, University of Glasgow. She provides contextual background, discusses the dataset and MNV (Minimum Number of Vessels), and the composition of the assemblage of Roman coarse wares: amphorae, mortaria, cooking pots, bowls, dishes, flagons, beakers, and a single cheese press. Numbers of sherds and vessels sizes are also documented.

2. "Romano-British kiln building and firing experiments: two recent kilns" by Beryl Hines (pp. 26- 38, 18 figures, 13 in color). The replication of two Romano-British kilns (one each at Rede Wood Henley and the second at Lackford Lakes, Suffolk), construction methods, vessel packing, firing, and unpacking are detailed. The importance of iron oxide, theories about the structure of the kiln roof, and the importance of dry fuel are also considered.

3. "New data concerning pottery production in the south-western part of *Gallia Belgica*, in light of the A29 motorway excavations" by Cyrille Chaidron (pp. 39-60, 16 figures). The ceramic products from two workshops at

Beauvais/Pays de Bray (Aux Marais and Rainvillers) are reviewed. Tierra negra clays had variable amounts of mica and produced grey pottery, while white vessels were made of kaolin. Three wares are considered: 1) Common reduced wares (especially grey butt beakers) including granular fabrics, silty wares, and sandy grey wares; 2) Oxidized wares (notably jugs and bowls); and 3) Bioclastic ware (identified by shell inclusions).

4. "A characterisation of coastal pottery in the north of France (Nord/Pas-de-Calais)" by Raphaël Clotuche and Sonja Willems (pp. 61-75, 15 figures). Indigenous wheel-turned wares from Roman and non-Roman town and kilns are considered, and descriptions of materials from four sites elaborated. Vessel body and rim forms and decorations are reviewed with particular attention to ovoid pots, urns, and cooking vessels. Sandy fabrics and shell tempered wares are discerned and six production sites noted, each with distinctive temper characteristics, and an assessment of diachronic changes characterized.

5. "Raetian mortaria in Britain" by Katharine F. Hartley (pp. 76-95, 11 figures, 1 table). Sites from the West Midlands and northern Wales (northwest England from Wilderspool to Carlisle) are the focus of her study. Red-brown or haematite slips applied to the upper sides of vertical vessel flanges are noted and problems of misnomers of prior designations are discussed. There are three categories within the Romano-British tradition: 1) alien forms (five Types A through E, origins for A and E remain unknown); 2) ordinary mortaria (one indigenous type, F); and 3) three types of hybrid forms (Aa, Bb, and Cc). Eight distinctive workshops were actively producing ceramics.

6. "Two Flavian to early Antonine Romano-British pottery kilns at 7a Fisher Street, Carlisle" by Melanie Johnson, Alex Croom, Katharine F. Hartley and Ray McBride, with contributions by Sue Anderson, Mike Cressey, Andrew Heald, Fraser Hunter, Adam Jackson and Jennifer Thoms (pp. 96-139, 19 figures, 10 tables). The rapid succession of two double-chambered circular sunken kilns excavated in 2002 are documented: Kiln 117 (the earlier of the two dated from the Flavian-Trajanic period which produced coarse wares and mortaria) and Kiln 113 (impacted by more recent foundation construction was dated to the late Hadrianic/early Antonine period and which fired coarse wares was also associated with a sherd dump). Among the 7,205 sherds, the authors identified 45 fabrics: four classes of amphorae, 15 fine wares, and 26 coarse wares. Some Samian wares were present as were quantities of mortaria. A catalog of objects is provided, some concordances included, and links to other workshops and

chronologies discerned. Coarse ware vessel forms included flagons, jars, cooking pots, bowls, dishes and five minor forms. The results of six specialized studies are also provided: 1) fired clay; 2) ceramic building material (especially Roman tiles); 3) small finds (metals: copper alloy, lead, iron, worked bone, and lignite); 4) rotary quernstones; 5) animal bone (cattle, sheep/goat, and pig predominate); and charcoal (mostly from oak and birch).

7. “Exports from Iberia: Understanding the production of Lusitanian amphorae and their significance in Roman commerce between the first and fifth centuries AD” by Andrew Philip Souter (pp. 140-168, 23 figures, 8 tables, 1 appendix with Tables 3-8). Amphorae kilns and products from the Algarve (southwestern Roman Portugal), Roman kilns, Lusitanian kilns are discussed. Amphorae forms included Dressel 14 and some 7/11 and 2/4 types; Almagro 50, 51a, 51b, and 51c; and a few other types. There is interesting data on fish product contents (*garum*), Fig. 16, p. 153. Lusitanian exports and destinations – spread from Portugal through the Mediterranean to Sicily and the Adriatic Sea – probable destinations, and data from 29 shipwrecks fit into this presentation which derive from Souter’s 2008 thesis at the University of Nottingham and a volume from the British Archaeological Report International Series 1739 (2008) on *garum* production.

8. “A brief history of the ceramic mortarium in antiquity” by Robin P. Symonds (pp. 169-214, 21 figures which include 267 vessel illustrations). The author begins by defining mortaria and primary characteristics of the vessel including potters’ stamps, fabrics, and vessel functions for the period 8th century BC through 7th century AD (the form survives longest in the eastern part of the empire). He discerns 21 typo-chronological ceramic groups and relates geographic distribution of the form through 14 regions, and concludes with seven broad questions that need to be addressed, namely, the need for better fabric descriptions and better fabric analyses.

9. “Rare and exotic amphorae in North-West Europe: Finds from the Roman fort on the Kops Plateau, Nijmegen” by Joost van den Berg (pp. 215-235, 12 figures). Data from the 1968-1975 excavations at a small Flavian Roman fort suggested three construction phases: 12/10 BC-AD 10, 10-35/40 AD, and 35/40-69/70 AD. Amphorae types recovered and described include Camulodunum 184 and 189, Dressel 43 and 6B, Kingsholm 117, and Lamboglia 2/Dressel 6A. The characteristics and geographical distributions of find sites from Britain to Anatolia are also presented.

10. “The Samian ware from Cardean and the Flavian occupation of Scotland” by Felicity C. Wild (pp. 236-247, 5 figures). Excavations from 1968-1975 are reviewed, as is the Samian typology, the Cardean assemblage, the use of potters’ stamps, and variations in decoration. 11. “Research Framework for Samian ware, 2012” by Gwladys Monteil, Naomi Sykes, Steven Willis and Edward Biddulph (pp. 249-255). This report focuses and a number of topics including resource potential, training, updating corpora, quantification standards, UK and international collaboration, excavated assemblages and publication priorities, and research themes. The latter embrace proto-industrialization, distribution and incidence studies, integrated studies, methodological advances (using GIS, for example), taphonomic studies (wear and repair), scientific analysis, onomastics, and iconography, among others.

The titles, authors, and authors of the six book reviews are: *Faces from the Past: A Study of Roman Face Pots from Italy and the Western Provinces of the Roman Empire*, Gillian Braithwaite, 2007, reviewed by Robin P. Symonds (pp. 256-257). *La Graufesenque (Millau, Aveyron), Vol. I: Condatomagus, une Agglomération de Confluent en Territoire Rutène Ile s. a. C. – IIIe s. p. C.*, D. Schaad (ed.), 2007, and *La Graufesenque (Millau, Aveyron), Vol. II: Sigillées Lisses et Autres Productions*, M. Genin (ed.), 2007, reviewed by Joanna Bird (pp. 257-262). *Salaisons et Sauces de poissons en Italie du Sud et en Sicile durant l’Antiquité*, E. Botte, 2009, reviewed by Robin P. Symonds (pp. 262-264). *Amphores vinaires de Narbonnaise, Production et grand commerce. Création d’une base de données géochimiques des ateliers*, F. Laubenheimer and A. Schmitt, 2009, reviewed by Robin P. Symonds (pp. 264-266). *Échanges et vie économique dans le Nord-Ouest des Gaules. Le témoignage des amphores du IIe siècle avant J.-C. au IVe siècle après. J.-C.*, F. Laubenheimer and E. Marlière, 2010, reviewed by Robin P. Symonds (pp. 266-267). *La céramique romaine en Gaule du Nord. Dictionnaire des céramiques: La vaisselle à large diffusion*, R. Brulet, F. Vilvorder and R. Delage, with the collaboration of D. Laduron, 2010, reviewed by Robin P. Symonds (pp. 268-270).

Volume 15 continues, after a hiatus, this splendid somewhat specialized publication which has much that can be applied to pottery from other times and places in the world. Four *JRPS* volumes have been reviewed in this column in previous issues of the *SAS Bulletin*: *Volume 10: Amphorae in Britain and the Western Empire* (Judith Plouviez and Robin P. Symonds, eds., 2003), *SAS Bulletin* 27(4):25-27 (Winter 2004). *Volume 11* (Pamela V. Irving, ed., 2004), *SAS Bulletin* 28(4):14 (Winter 2005). *Volume 13: A*

Mortarium Bibliography for Roman Britain (Katharine F. Hartley and Roberta Tomber, with Peter V. Webster, eds., 2007), *SAS Bulletin* 30(3):21 (Fall, 2007). And *Volume 14*: (Pamela V. Irving and Steven Willis, eds., 2009), *SAS Bulletin* 33(3):13 (Fall, 2010).

Previous Meetings

SAA Meeting

The 78th Annual Meeting of the Society for American Archaeology was held in Honolulu, Hawai'i, 3-7 April 2013, with sessions and papers on pottery well-represented. Six symposia (four oral and two poster sessions) were devoted entirely to ceramics; the session abstract, the presenters and their paper or poster titles are listed. More than 120 presentations focused on ceramic materials. The SAA paper abstracts are online only; no printed abstracts are distributed any longer. There were 3,318 registrants, making this the fifth largest SAA meeting of the 78 held to date.

SYMPOSIUM: SOUTH AMERICAN CERAMICS, Chairs: Maline Werness-Rude and Kimberly Jones. Session Abstract: Scientific and visual studies of ceramics have prompted some of the most profound advances in research on pre-Columbian South America. Ceramic seriation has been fundamental in structuring regional chronologies, type-variety classifications have permitted the exploration of regional traditions, and iconographic studies have aided interpretation of the archaeological record. Despite the primacy afforded this media, however, considerable questions emerge when addressing aspects such as regional versus local seriation, local versus intrusive styles, fineware versus domestic objects, and media versus message in ceramic iconography. The papers in this session address these aspects in key areas and periods of South American pre-history. The Papers: Karen O'Day "Inferring Identity of Gran Coclé Anthropomorphic Effigy Vessels ca. 550-1150 C.E."; Isabelle Druc "Consumers Dictate, Potters Adapt: A View from the Andes"; Eisei Tsurumi "The Early Ceramic from Tembladera and Its Chronological Sequence"; Kimberly Jones "Sculpted Vessels: Content and Comparisons in Cupisnique Material Culture"; Jean-Francois Millaire, Flannery Surette, and Jordan Downey "Entangled Pots and Rags: Luxury-Objects Making in the Virú Valley, Peru"; Juliet Wiersema "Moche Architectural Vessels as Diagrams of Sacred Space"; George Lau "Intermediality and the Recuay style (A.D. 200-600), North Highlands of Peru"; Maline Werness-Rude and Lisa DeLeonardis "Burned, Bundled, Buried: The Substance and Context of Paracas Ceramic Offerings"; Yuichi Matsumoto "Paracas in the Highland?

Interregional Interactions between the Peruvian South Coast and South-Central Highlands"; Lauren Gallow and Deborah Spivak "Alternative Style: Abstraction in Loro Ceramics of the Middle Horizon South Coast"; Kevin Vaughn served as Discussant.

SYMPOSIUM: USING THE BRUKER TRACER IIV+PORTABLE ED-XRF ANALYZER TO INVESTIGATE COMPOSITIONAL VARIATION IN ARCHAEOLOGICAL CERAMICS AND NATURAL CLAYS, Chairs: John Richards and Patricia Richards. Session Abstract: The recent availability of portable, non-destructive x-ray fluorescence analyzers (pXRF) has generated a flurry of new research aimed at compositional variation in a variety of archaeological materials. While the bulk of pXRF studies have been oriented to analyses of obsidian and basalts, this symposium presents results of pXRF analyses that focus exclusively on clays and ceramics. Prehistoric datasets represent studies of clays and sherds from Bronze Age Syria, Late Iron Age Sicily, and the late prehistoric Midwestern United States. Historic period studies include datasets reflective of the 19th Century Belgian occupation of Wisconsin's Door Peninsula and the antebellum potteries of the Edgefield District of South Carolina. Results of these studies provide insight into a wide variety of archaeological problems and highlight issues with, and prospects for, the application of pXRF analysis to archaeological ceramics. The Papers: Bruce Kaiser "Photon Physics in Archaeology: The State of the Art"; Elissa Hult "A Statistical Model for Compositional Analysis and Clay Sourcing Using the Portable X-Ray Fluorescence Device for Analysis of Prehistoric Ceramics"; Jocelyn Boor "Compositional Analysis of Bronze Age Ceramics from Tell Hadidi, Syria: A Comparison of Three Data Sets"; William Balco "Compositional Analysis of Indigenous Iron Age Pottery from Western Sicily: From Challenge to Interpretation"; Michelle Birnbaum "Characterizing North Bay Ceramic Pastes Using pXRF, XRD, and Optical Petrography"; Jennifer Haas "Middle Woodland in Southeast Wisconsin: Ceramic Composition at the Finch Site"; Jennifer Picard, Jennifer Haas, and Ricky Kubicek "Sourcing Late Woodland Collared Ware and Madison Ware Vessels from the Finch Site, Southeast Wisconsin"; Seth Schneider "Oneota Interaction among Three Localities in Eastern Wisconsin: Ceramic Compositional Analyses of Six Oneota Pottery Assemblages"; Marcus Schulenburg "Identifying Non-Local Pottery: pXRF Analysis of two Fort Ancient Assemblages"; John Richards and Seth Schneider "Ceramic Paste Composition at Cahokia and Aztalan: A Comparison Using Portable X-ray Fluorescence and Ceramic Petrography"; Thomas Zych "Stylistic and Compositional Variability in Pottery from the Northeast

Platform Mound at Aztalan”; Jill Kotwasinski and John Richards “A Compositional Perspective on Ceramics from the 2011 UWM Excavations at the Aztalan Site”; Patricia Richards and Lisa Zimmerman “Belgian Brickworks on the Door Peninsula: A Preliminary Compositional and Spatial Analysis of Hand-Molded Bricks from the Vandermissen Brickworks”; and George Calfas, Michelle Birnbaum, and John Richards “These Pots Talk: Where Were Face Vessels Manufactured?” James Skibo was the Discussant.

SYMPOSIUM: CIRCUMPOLAR CERAMICS: POTTERY TECHNOLOGY AND THE “FORAGING SPECTRUM” Chairs: Kevin Gibbs and Peter Jordan. Session Abstract: Archaeologists have often linked the emergence of pottery to the “Neolithic” transition and farming but recent evidence from across the northern world has demonstrated an early use of pottery by hunter gatherers. The basic chronological and culture-historical features of this hunter-gatherer ceramic “horizon” are now relatively well established for some regions but understandings of how and why prehistoric foragers integrated the production, use and exchange of pottery within subsistence adaptations and social practices remain less clear. This session integrates ceramic analyses within hunter gatherer archaeology, focusing on higher-latitude case-studies from North America, Europe and Asia and integrating recent analytical insights from archaeological sciences and interpretive insights from theories of technology, innovation and social practice. Higher-latitude hunter-gatherers are interesting for technology studies because these communities must adjust their life-ways and material culture to the opportunities and constraints presented by strong seasonality and the uneven and often unpredictable distribution of resources across the northern landscape. How pottery became a feature of these adaptations is not well understood nor is the transformative implications and socio-cultural significance of integrating pottery within hunter-gatherer life-ways. Archaeologists studying hunter gatherer pottery should develop frameworks for understanding these issues rather than simply adopting models developed to study pottery of agricultural societies. The Papers: Junzo Uchiyama “Investigating the Socio-Economic Contexts of Early Pottery Innovation in Jomon Japan (Honshu and Kyushu), ca. 16,500-7,500 B.P.”; Hirofumi Kato and Hirofumi Kato “Mobile or Settled: Cultural Functional Diversities of Prehistoric Pottery in Hokkaido Island”; Shelby Anderson “The Difficulty of Sourcing Hunter-Gatherer Pottery: A Case Study from Northern Alaska”; Erik Gjesfjeld “Hunter-Gatherer Pottery Production, Use, and Exchange in the Remote Kuril Islands”; Peter Hommel, Peter Day, Peter Jordan, and Viktor Mikhailovich Vetrov “Vessels of the Vitim: A

Study of Ust'-Karenga and Ust'-Yumurchen Ceramics”; Liam Frink and Karen Harry “An Experimental Examination of Central Canadian Arctic Hunter-Gatherer Pottery and Soapstone Containers”; Toshiro Yamahara “Early Pottery in East Hokkaido, Japan”; Fredrik Hallgren “A Grinding Halt: On the Western Boundary in the Spread of Early Hunter-Gatherer Pottery in Fennoscandia”; Rick Knecht, Ana Jorge, and Kate Britton “The Form and Function of Ceramics in Arctic Prehistory”; Tetsuhiro Tomoda “Pottery Diversity and Cultural Connections in Northern Japan”; Karine Tache and Oliver Craig “Patterns of Early Pottery Uses in Northeastern North America: Insights from Organic Residue Analysis” Sven Isaksson, Peter Jordan, and Kevin Gibbs “Same but Different: Pottery Use among Prehistoric Hunter-Gatherers in NW and NE Eurasia”; Oliver Craig, Carl Heron, Junko Habu, Mio Katayama Owens, and Yastami Nishida “Specialization in the Use of Hunter-Gatherer Pottery from Japan? Evidence from Lipid Residues”; Matthew Boyd, Andrew Lints, Clarence Surette, and Scott Hamilton “Maize Horticulture and the Woodland Tradition in Subarctic North America”; and Yastami Nishida, Hayley Saul, Carl Heron, and Oliver Craig “Hot Dishes in the Beginning of Jomon Period, Japan.” Brian Hayden was the Discussant.

POSTER SESSION: CERAMIC STUDIES IN THE AMERICAN SOUTHWEST The posters: Judith Habicht-Mauche and Suzanne Eckert “Sourcing Western-Style Glaze Painted Pottery from Tijeras Pueblo, NM”; Suzanne Eckert, David Snow, Kari Schleher, Judith Habicht-Mauche, and W. D. James “Following the Yellow Brick Road: Yellow Slip Clays and the Production of Rio Grande Glaze Ware in North Central New Mexico”; Sachiko Sakai “Application of Optically Stimulated Luminescence (OSL) Dating to Examine Change in Production and Distribution Pattern of Olivine-Tempered Ceramics in the Arizona Strip and Adjacent Areas in the American Southwest”; Thomas Wambach “Bent Out of Shape: Warping in Virgin Branch Ancestral Puebloan Ceramics”; Jordan Jarrett and Andrew Duff “Ceramic Evidence for Distinct and Concurrent Puebloan and Mogollon Cultural Traditions at Largo Gap in New Mexico”; Shilo Bender, Jeffrey Ferguson, and Scott VanKeuren “Rapid Qualitative Compositional Analysis of Ceramic Paints: A Study of Fourmile Polychrome”; Samantha Linford and Michael Whalen “A Design Analysis Comparing Escondida Polychromes and Gila Polychromes”; Emma Britton “Preliminary Analysis of Black Pigment Recipes on Casas Grandes Polychromes”; and Victoria Evans and Warren Lail “The Representation of Plants in Hohokam Pottery Design.” **POSTER SESSION: NEW WORLD CERAMIC TECHNOLOGY** The posters: Andrea Einck “Petrographic Analysis of

Historic Brownwares at a 19th Century Military Fort: Results and Implications”; Travis Freeland “An Assessment of Portable X-Ray Fluorescence (PXRF) for Ceramic Compositional Analysis”; Sylvie Kvetinova “Material Culture as a Vehicle of Social – Political Organization: Chimu Pottery”; Benjamin Nigra, Kevin Hill, Michael Rosales, Chloe Tolman, and Camille Weinberg “An Analysis of Surface Ceramics from Cerro del Gentil, a Paracas Adobe Mound in the Chincha Valley, Peru”; Edward Zegarra “Ceramic Production in the Wari Heartland: The Search for an Understanding of the Relationship between Type and Function Using Statistical Analysis Programming”; Sarah Nixon and James VanderVeen “Reproducing Ceramic Vessel Form to Reconstruct Usage: A Case Study of the Caribbean ‘Water’ Bottle”; Elizabeth Jaroszewski “Ceramic Analysis of Southeastern Idaho Plain Ware from the Pioneer Site, Northeastern Snake River Plain.”

SYMPOSIUM: CERAMICS AND SOCIETY IN EARLY MESOAMERICA AND THE AEGEAN Chairs: Peter Day and Wesley Stoner. Session Abstract: The emergence of complex society forms a focus of attention in both Mesoamerica and the Aegean, with ceramic production, exchange and consumption pivotal to understandings of social change. Within this framework, physico-chemical approaches to ceramics have played an important role and many methodological advances in analysis have been developed in the two regions. Recent research, notably that integrates chemical and petrographic approaches, has been successful in overcoming a rivalry between analytical techniques. There has emerged an acceptance of their complementary nature, and we have moved on to detailed analysis of the way in which pots are crafted, lives constructed with ceramics, and how pottery and contents can be used to influence political and social reality. This symposium brings together papers which highlight the variability in approaches to similar topics investigated on either side of the Atlantic Ocean. Often employing a multi-technique perspective, the presentations demonstrate that study of emerging states, in the Formative and Early Bronze Age periods respectively, can illuminate issues such as colonization, the movement of craftspeople, the adoption and imitation of form, and the complex world of consumption. In both areas, chronologically later examples reveal a multi-layered world of ceramics beyond one of simple centralized control. The Papers: David Cheetham, Clarus Backes, James Burton, Michael D. Glascock, and Hector Neff “Chemistry and Colonization: Gulf Olmec Signatures at Canton Corralito, Chiapas, Mexico”; Deborah Nichols, Wesley Stoner, Bridget Alex, and Destiny Crider “Altica and Early-Middle Formative Exchange in the Basin of Mexico: A

Multi-Method Approach to Compositional Analysis”; Ronald Bishop, James Doyle, Socorro Jiménez Alvarez, Iliana Ancona Aragón, and James Blackman “Middle-Late Formative Maya Ceramics: Circulation or Local Production?” Mia Jorgensen and Wesley Stoner “Potters, People, and Pottery: New Insight on Formative Period Teotihuacan Based on NAA and LA-ICP-MS of Ceramics from the Sites of Cuanalan, Tezoyuca, and Plaza One”; Wesley Stoner and Christopher Pool “Revisiting Classic Period Economic Development in the Tuxtla Mountains, Southern Veracruz, Mexico”; Peter Day, Anno Hein, Vassilis Kilikoglou, Noémi Müller, and David Wilson “Reconstructing Practice in Kampos Group Ceramics: Technological and Cultural Diversity in the Early Third Millennium B.C.”; Clare Burke Davies, Peter M. Day, Anno Hein, Aggeliki Kosyva, and James R. Wiseman “Settlement Scale, Pottery Production, and Patterns of Consumption in Early Helladic Korinthia and the Argolid”; Vassilis Kilikoglou, Ourania Kouka, Maria Relaki, Vasif Sahoglu, and David E. Wilson “Populations, Potters, or Shapes: What’s on the Move in the Kastri Group?”; Roberta Montesana, Peter M. Day, and Simona Todaro “Pottery Manufacture in Phaistos: Continuity and Change over Two Millennia”; Will Gilstrap, Peter M. Day, Christina Marabea, Konstantina Kaza, and Eleni Konsolaki “Bottoms Up: Ceramic Production and Consumption in the Late Mycenaean Saronic Gulf, Greece.” Roger Doonan was scheduled to serve as Discussant but could not attend; Hector Neff served and provided an admirable discussion relating climatic conditions to the cultures in both regions.

Eight sessions had a number of ceramic contributions; the session title, and the authors’ names and paper titles are tabulated. **SYMPOSIUM: INVENTION AS A PROCESS: PYROTECHNOLOGIES IN PRE-LITERATE SOCIETIES.** Papers presented by Thilo Rehren “Inventing Technical Ceramics”; Roger Doonan and Peter Hommel “Between Ideas and Objects: The Doings of Invention in Pottery and Metallurgy”; and Thomas Fenn (scheduled but not presented) “Invention or Innovation? Pyrotechnological Connections between Metallurgy, Glass, and Glazes.” **GENERAL SESSION: CRAFT PRODUCTION, TECHNOLOGY, AND IDENTITY IN THE AMERICAN SOUTHWEST.** Presentations by Mary Ownby and Deborah Huntley “Production and Exchange of Polychrome Pottery in the Upper Gila and Mimbres Valleys: Results from Neutron Activation and Petrographic Analyses”; Brunella Santarelli, Christina Bisulca, and Nancy Odegaard “Investigation of Basketmaker III Lead Glaze Technology in the Southwest”; Scott Ure “Parowan Valley Potters: Examining Technological Style in Fremont Snake Valley Corrugated Pottery Produced in

the Parowan Valley, Utah”; and Reese Cook “Analyses and Implications of Prehistoric Southwestern Tradeware Pottery from the Mojave Desert and Coastal Areas of California.

SYMPOSIUM: PATTERNS OF POSTCLASSIC MESOAMERICAN COMMUNITIES. Chair: Yuko Shiratori. The papers were by Marc Levine, Leslie Cecil, Lane Fargher, and Jamie Forde “Mixteca-Puebla Polychromes, Marketing, and Household Ritual at Tututepec: Integrating INAA and Petrographic Techniques”; and Patricia Urban and Edward Schortman “Politics by Design: Performing Power through the Manipulation of Ceramic Designs in the Naco Valley, Northwestern Honduras.”

SYMPOSIUM EMPIRE: ECONOMY, AND URBAN SOCIETY AT AZTEC PERIOD CALIXTLAHUACA, MEXICO. Contributions by Angela Huster “Of Comales, Cotton, and Aztec Orangeware: The Effects of Aztec Conquest at Calixtlahuaca”; and Jennifer Meanwell “A Petrographic Analysis of Domestic Pottery Consumption at Calixtlahuaca.”

SYMPOSIUM: TECHNOLOGY IN SOUTHWEST CHINA AND SOUTHEAST ASIA II: WORKING WITH STONE, CERAMICS, AND OTHER MATERIALS –TECHNOLOGICAL INNOVATION IN SOUTHEAST ASIA, SOUTHWEST CHINA, AND BEYOND. Papers included those by Darith Ea “The Torp Chey Ceramic Kiln Site”; Michael Dega and Kaseka Phon “The Ceramic Production Center of Cheung Ek, Phnom Penh, Kingdom of Cambodia”; Kuei-chen Lin “Pottery Production in the Ancient Chengdu Plain”; and Ling-yu Hung and Jianfeng Cui “Development of Neolithic Potting in the Eastern Tibetan Plateau.”

SYMPOSIUM: ARCHAEOLOGICAL METHODS, ARCHAEOLOGICAL MATERIALS, AND ANCIENT TECHNOLOGIES. (Sponsored by Society for Archaeological Sciences) The presenters were Christian Fischer, Ioanna Kakoulli, Sandra L. Lopez Varela, Christian De Brer, and Kim Richter “The Jaina-Style Figurine Project: Portable Technologies, Advantages, and Limitations”; Michael Deibel, Emily Stovel, and William Whitehead “Changes in Mortuary Ceramics and Ritual between the Middle and Late Intermediate Periods (A.D. 500-1450): Using pXRF in Northern Chile”; and Michael Gregg and Greg Slater “Improving the Diagnostic Capabilities of GC-CIRMS Analyses of Organic Residues in Archaeological Pottery.”

Nineteen other papers on pottery were scattered through the sessions and included: Susan Pollock “Commensality

and Painted Pottery Traditions in the Late 5th Millennium in Southwestern Iran”; Lisa DeLeonardis “Encoded Color, Encoded Value in Paracas Post-Fired Painted Ceramics”; M. Colleen Hamilton and Kholood Abdo Hintzman “Mission San Gabriel Ceramics: Distribution and Frequencies of Occurrence of Exports and Indigenous Ceramics”; Suzanne Griset “Native American Ceramics in 19th Century Los Angeles Basin”; Andrew Hardy “Multiple Functions of Pre-Columbian Buildings in the Andes: A Ceramic Analysis of Pyramid 3 in Panquilma, Peru.” Takashi Sakaguchi “Foundations of Jomon Male Symbolism Seen from Vessels with Phallic Spout”; Michael Ligman “Put That in Your Pipe and Smoke It: An Exploratory pXRF Study of Native American Ceramic Tobacco Pipes at Jamestown, Virginia”; Ronald Castanzo “The Identification of Ceramic Production and Exchange in Archaeological Contexts: A Multifaceted Approach”; Enrique Rodriguez and Wesley Stoner “Cooking for a Change in Colonial Mexico”; Robert Markens “Ceramic Imagery and Political Power at Early Monte Albán, Valley of Oaxaca”; Cira Martinez Lopez and Marcus Winter “El Ajuar cerámico de la fase Danibaán y los primeros siglos de urbanismo en Oaxaca”; Carlo Lucido, Sarah Barber, and Arthur Joyce “Pottery, Feasting, and Urbanism in the Lower Rio Verde Valley, Oaxaca”; Richard Blanton, Lane Fargher, and Verence Heredia Espinoza “Pottery, Production, and Politics at Late Postclassic Tlaxcallan”; Christopher Pool, Philip Arnold, and Ponciano Ortiz “Radiocarbon and Ceramic Chronologies of Matacapán, Veracruz, Mexico”; Steven Dorland “Shifting Perceptions of Pottery Decoration: A Multi-scalar Analysis of Two Middle Iroquoian Villages in Southern Ontario”; Robert Cromwell—Comparing the Ceramics of Early-19th Century Fur Trade British Fort Sites along the Columbia River”; Sungjoo Lee “The Transmission of Forming Techniques and the Specialization in Ceramic Production during the Proto-historic Period in South Korea”; Jeong Yong Seong “Baekje’s Formation of an Ancient State Observed through Pottery Style”; and Rory Walsh “Chemical Analyses of Baekje Pottery and the Social Processes of State Formation.”

ARCHAEOLOGICAL CHEMISTRY

Ruth Ann Armitage, Associate Editor
Jim Burton, Guest Associate Editor

The American Chemical Society sponsored the **12th Archaeological Chemistry Symposium**, April 8th and 9th, as part of the 245th National Meeting of the ACS in New Orleans, Louisiana. Ruth Ann Armitage, Eastern Michigan University, and James Burton, University of Wisconsin - Madison organized the meeting with

substantial financial and logistic support from the ACS Division of the History of Chemistry, who has sponsored every symposium in this series since its inception in 1950. Additional support came from the Society for Archaeological Sciences and Bruker, manufacturer of portable X-ray fluorescence instruments.

The symposium consisted of four half-day symposia, an evening poster session, and a keynote address by Mark Pollard, RLAHA - Oxford University.

The organizers choose four broad categories for the symposia: Pigments, Residues and Material Analysis, X-Ray Fluorescence Spectroscopy, and Isotopes in Archaeology.

On Monday morning, after introductory remarks by Ruth Ann Armitage, the symposium on pigments included presentations by:

- Rachel Popelka-Filcoff on using mining technology for nondestructive analysis of cultural heritage materials
- Kaixuan Bu on sourcing Pecos River rock painting pigments by ICP-MS
- Mary Virginia Orna on characterizing pigments in medieval manuscripts to trace Armenian and Byzantine artists' influences
- Joseph Barabe on characterizing the ink on the *Gospel of Judas*
- Zvi Koren on analysis of blue *tekhelet* dye from Masada
- Christina Varney on developing direct MS methods for application to organic pigments in manuscripts

The afternoon symposium on organic residues opened with an invited talk by Valerie Steele, currently at the British Museum, on the achievements and challenges of organic residue analysis. The other presentations in the session were by:

- Scott Grayson on work towards identifying *pulque* on Mesoamerican ceramics
- Daniel Fraser on characterizing 18th century glues from George Washington's childhood home
- Ruth Ann Armitage on recent developments in direct analysis in real time mass spectrometry for analysis in cultural heritage science
- Anne Skinner on ESR dating of materials from Kharga Oasis, Egypt
- Magdalena Balonis-Sant on new consolidants for preservation of wall paintings

- Kristina Cheung on analysis of archaeological materials from El Zotz
- Dennis Braekmans on ICP-OES characterization of Roman amphorae

The evening poster presentation, organized by Seth Rasmussen of the ACS Division of the History of Chemistry, was part of the ACS cross-disciplinary "Sci-Mix" poster session and included posters by Heather Walder, John Hopkins, Calvin Day, Dhia Habboush, Magdalena Balonis-Sant, Kasey Hamilton, Choon Ho Do, Joseph McPeak, Ruth Beeston, and two by Robert Tykot and colleagues.

Tuesday morning, after opening remarks by James Burton, Aaron Shugar from Buffalo State University presented an invited talk on issues with portable XRF instruments. This was followed by presentations by:

- Hasan Ashkanani on pXRF analysis of Bronze Age ceramics from Kuwait, Bahrain, and the Indus Valley.
- Eric Dyrdaahl on pXRF for provenance of Ecuadorian obsidians
- Mark Benvenuto on XRF analysis of coins from three different historic periods
- Heather Walder on LA-ICP-MS analysis of glass pendants from the Great Lakes area

After the Tuesday morning session, Mark Pollard, Director of the Research Laboratory for Archaeology and the History of Art and Edward Hall Professor of Archaeological Science at Oxford University, gave the keynote address, "A Career in Ruins", in which he presented some of the deep history of archaeological sciences combined with comments on current challenges in archaeological chemistry.

The PM session included two invited talks, one by Alyson Thibodeau from the University of Toronto on the use of heavy isotopes (Sr and Pb) to determine provenience of geological materials including turquoise and one by Matt Sponheimer from the University of Colorado- Boulder on the use of light isotopes to understand the ecology of early hominins. Other presentations were by:

- James Burton on the dangers of using non-human isotopic data to determine geographic origins of humans
- Carlos Tornero on the use of oxygen isotopes to determine seasonality in sheep populations in Early Eneolithic Romania

- Karen Steelman on plasma oxidation for stable isotope analysis of stone tools
- Katherine Miller on using stable isotopes to investigate population movement in ancient Honduras
- Page Phillips on geochemical analysis of occupation surfaces at Roatan Island, Honduras

More specific details of the presentations are available on the ACS website under the "HIST" section at <http://abstracts.acs.org/chem/245nm/program/divisionindex.php>.

A press conference highlighting some of the talks at the Symposium can be viewed online at <http://www.ustream.tv/recorded/31121047>.

The organizers will be publishing peer-reviewed contributions from the 12th Archaeological Chemistry Symposium as a new volume in the ACS Symposium Series, to be published by the ACS in 2014.

We thank all of the participants in the Symposium, and look forward to completing the book this summer.

BIOARCHAEOLOGY

Katy Meyers, Associate Editor

Bioarchaeology in the Field

As the summer approaches, many archaeologists' thoughts turn to their field season, whether doing their own independent excavation, conducting survey prior to construction, leading or attending a field school. Fieldwork is an essential part of being an archaeologist, and for bioarchaeology it means getting the opportunity to excavate human remains. There are currently dozens of field schools all around the world spanning drastically different time periods where one can learn the proper methods for excavating burials. In this article, I want to discuss the role the fieldwork plays in our interpretation of not just the human remains but also the broader burial context.

First there is the interpretation of the burial itself. Archaeoethanatology, or *anthropologie de terrain*, is a method in mortuary archaeology, which is based on using taphonomy to infer unknowns about burial context. As espoused by Duday (2009), the method requires detailed recording during excavation including the identification of skeletal elements in situ, anatomical orientation, and spatial relationship to other elements. Archaeoethanatology aims to identify and account for

taphonomic processes, which alter the original characteristics of the funerary deposit in order to determine the original burial context. A new study by Littleton et al. (2012) uses this method in order to better understand the role of khirigsuurs, a distinctive type of Mongolian burial mound.

The role of khirigsuurs has been heavily debated. They are distinctive dry stone monuments found on the Mongolian steppe, and are associated with the practices of the late Bronze Age peoples (3500-2700 years ago). They are made primarily of local stone, and are highly variable in size and construction. There is usually a large central chamber, covering mound and a surrounding fence. It is unknown whether these were built purely as monuments or as symbolic burial places. Littleton et al. (2012) argues that the khirigsuurs' primary function was funerary, and through a systematic analysis of the skeletal preservation this hypothesis can be supported. They excavated 35 khirigsuurs using the archaeoethanatology method. Following this, they were careful to note any signs of disturbance in the mound: human, animal or natural. All human remains found were exposed and carefully recorded in situ to note burial integrity, body orientation, and burial dimensions. The goal was to determine the relationship between external conditions and the preservation/articulation of the skeletal remains. The external conditions examined included intrinsic conditions (nature and location of the grave including slope and location in ground, biological traits of the individual interred) and extrinsic conditions (human or animal activity after burial, burning, burrowing, root disturbance). The preservation and articulation were numerically scored so they could be compared against the conditions.

Based on the results of the analysis between conditions of burial and preservation, they argue that the primary function of the khirigsuurs was as burial mounds. The reason that this conclusion had been previously disputed was a lack of human remains in the mounds. However, they found that preservation within the mounds is highly variable and correlates with certain conditions. Human remains were more likely to be recovered in khirigsuurs that were located on flat ground and had intact capstones. Conversely, when capstones were disturbed and the mounds were constructed on slopes it was less likely that the remains were intact. In addition to this, they found that the skeletal elements found in the mounds were those that were most likely to survive poor preservation conditions- adult long and flat bones with high amount of cortical hard tissue, rather than subadult cancellous dominated bones.

By examining the taphonomy of the grave they are able to determine the reason that there is variation in bone preservation of the khirigsuurs as well as determine their primary function. Studies like this are important because they aim to determine the original context of the burial. It is quite easy to look at the archaeological site and interpret it as the final burial location, but this direct observation ignores the fact that over time the original context of the burial has changed. As a body decomposes it will shift its position in the ground. Over time the mounds will change, allowing for animals to disturb the remains or weather conditions to erode and shift soil. The goal of this work is use the site as we find it to determine what the original conditions of the burial were, then interpret from there.

While the excavation is progressing, the process of sifting the recovered dirt is occurring at the same time. Sifting dirt is one of the activities that occurs on almost every archaeological site, whether a large scale excavation or small scale study of the insides of cremation urns. The process involves putting all soil recovered from the excavation through a mesh wire screen. It improves the recovery rate of small artifacts and is an important step in archaeology. A new article by Mays, Vincent and Campbell (2012) explores the current process of sifting at mortuary sites and re-assesses the practice. Sieving the soil below the burial, while suggested, is often overlooked. The authors note, "there is a dearth of empirical studies of recovery of human remains from archaeological sites which measure the effectiveness of over hand retrieval, or which compare the merits of using sieves of different mesh sizes". The goal of their study is to fill this gap and provide empirical data on the value of sieving, primarily in poorly preserved inhumation burials and loose teeth. They also assess the differences between hand collection and sieving, and the different size mesh screens.

The study was conducted during the excavations at the cemetery site of Whitby from 1999-2000. The cemetery was in use from the 7th to 9th century CE. The burials lacked grave goods, but the presence of nails suggested that some of the individuals were interred in coffins. Preservation at the site was fairly poor and wood survived due to the clay underlying the soil. This also caused poor preservation of the human remains; 325 graves were excavated but only 225 preserved any skeletal material. All the remains recovered were highly fragmented. The process for the sieving experiment involved removal of all grave fill by trowel to expose the skeleton. The burial was recorded and photographed, and then the exposed remains were removed by hand. Any soil remaining in the grave was then recovered in three samples for sieving and

floatation. Sample A corresponded to the head area of the grave, sample B to the torso and sample C to the legs/feet area. All soil was wet sieved, a process involving gently washing the sieve and soil with water through a stack of sieves of decreasing mesh size (8mm, 4mm, and 2mm). Screens of 8 and 4mm were handpicked through for human remains, and 2mm was scanned. The samples found in the sieve were weighed separately in order to determine the success of the process, and they were scored by reliability of identifying the portions of bone (i.e. cranial versus axial versus dental).

Of the 70 burials that underwent this process, in 62 dental elements were found in the screening process and in 51 there were identifiable skeletal elements. Skull fragments were identified in 43 burials, 34 had fragments of long bones and 15 had fragments of other identifiable skeletal elements. Of the 62 burials with dental remains, a total of 946 permanent teeth were found, of which 913 (97%) were recovered during the sieving process. Overall, sieving increased the weight of the recovered human remains by 53% more than traditional hand collection alone. While studying human remains is important, we need to remember that this is completely reliant on our ability to remove as much of the skeleton from the grave as possible, collecting all available evidence. This study demonstrates that meticulous removal of small elements, such as dentition, can result in a substantial increase in material available for study.

These two articles highlight the correlation between the material collected in the field to the interpretation of human remains and burial sites. Careful record keeping about broader context of the burial and attention to the collection of all possible remains might provide unexpected opportunities to reduce bias. Improved methods in the field will lead to increased data and better interpretations in the lab. Good luck to everyone with their summer work in the field, lab, or office.

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UPCOMING CONFERENCES

Rachel S. Popelka-Filcoff, Associate Editor

2013

22-26th April. GMPCA Archaeometry Conference, Caen, France. General information:
<http://www.unicaen.fr/archeometrie2013/index.htm>

9-10 May. ArcLand Conference "From Known Knowns to Unknown Unknowns: Remotely Detecting the Past. Dublin, Ireland". General information:
<http://www.archaeolandscapes.eu/index.php/en/outrach/conferences/347-u2k2.html>

13-17 May. National Park Service's 2013 Archaeological Prospection Workshop. "Current Archaeological Prospection Advances for Non-Destructive Investigations in the 21st Century" Cedar Point Biological Station near Ogallala, Nebraska, USA. Contact information: Steve DeVore: steve_de_vore@nps.gov

14-17 May. American Geophysical Union "Meeting of the Americas". Cancun, Mexico. General information:
<http://sites.agu.org/meetings/>

15-18 May. 36th Annual Meeting: Society of Ethnobiology. "Climate Change and Ethnobiology". Denton, TX USA. General information:
<http://ethnobiology.org/conference/upcoming>

15-18 May. International Open Workshop: "Socio-Environmental Dynamics over the Last 12,000 Years: The Creation of Landscapes III". Kiel, Germany. General information: <http://www.workshop-gshdl.uni-kiel.de>

26-31 May. International Federation of Rock Art Organizations (IFRAO). Albuquerque AZ USA. General information: <http://www.ifrao2013.org>

29 May-June 2. International Conference on Archaeological Prospection, Vienna, Austria. General information: <http://ap2013.univie.ac.at>

19-22 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

25-28 June. 10th Conference on Hunting and Gathering Societies (CHaGS). Liverpool, UK. General information:
<http://www.liv.ac.uk/sace/CHAGS/index.htm>

1-7 July. 1st International Congress on Stratigraphy (STRATI 2013), Lisbon, Portugal. General information:
<http://www.strati2013.org>

3-7 July. Association of Southern African Professional Archaeologists Biennial Conference (ASAPA 2013). Gaborone Botswana. General information:
<http://www.ub.bw/ocs/index.php/asapa2013/>

3-7 July. 1st International School on the Characterization of Archaeological and Historical Mortars and Plasters. Archaeology, Archaeometry and Conservation (1st-ISCARM). Calabria, Italy. General information:
<http://www.smfn.unical.it/iscarm/>

12-15 July. Analyzing Cultural Heritage using Portable Magnetic Resonance. Volterra, Italy. General information: <http://www.mc.rwth-aachen.de>

24-26 July. SHARING CULTURES 2013 3rd International Conference on Intangible Heritage. Aveiro, Portugal. General information:
<http://www.sc2013.greenlines-institute.org>

5-9 August. 62nd Annual Denver X-Ray Conference. Westminster, CO, USA. General information:
<http://www.dxcicdd.com/>

5-9 August. Landscape-scale palaeoecology: towards quantitative reconstruction of landscape-scale vegetation mosaics from pollen data. Hull, UK. General information:
http://www2.hull.ac.uk/science/geography/about_us/news/conferences

18-21 August. CANQUA-CGRG Biannual Meeting Edmonton, Alberta, Canada. General information:
<http://www.canqua.com/meetings>. Abstract deadline: March 30, 2013

20-24 August. International Symposium on Chert and Other Knappable Materials, Romania. General information: <http://arheoinvestsymposium.uaic.ro/eng/>
Abstract deadline: February 1, 2013.

25-29 August. Euroanalysis. Warsaw, Poland. General information:

<http://www.euroanalysis2013.pl/index.php?option>.

Abstract deadline: May 15, 2013.

28-30 August. RGS-IBG Annual Conference 2013, London, UK. General information:

<http://www.rgs.org/WhatsOn/ConferencesAndSeminars/Annual+International+Conference/Annual+international+conference.htm>

28-30 August. UK Luminescence & ESR Meeting. Aberystwyth Scotland. General information:

<http://earthsci.st-andrews.ac.uk/uklum2013.html/>

4-8 September. European Association of Archaeologists. Pilsen, Czech Republic. General information:

<http://www.eaa2013.cz/>

8-12 September. 246th National Meeting and Exposition, American Chemical Society. Indianapolis IN, USA. General information:

<http://www.acs.org>.

19-21 September. 12th European Meeting on Ancient Ceramics (EMAC2013). Padova, Italy. General information:

<http://mac2013.geoscienze.unipd.it>

29 September to 4 October. SciX Conference (Analytical Chemistry). Milwaukee, WI, USA.

<http://www.scixconference.org> Abstract deadline: May 24; Poster abstract: July 31

16-18 October. LASMAC- 14th Latin American Symposium on Physics and Chemistry Applied to Archaeology, Art and Cultural Heritage Conservation. Bogota, Colombia. Abstract deadline: May 30 2013. Contact: lasmac2013@gmail.com.

17-19 October. Paleoamerican Odyssey. Santa Fe, NM, USA. General information:

<http://paleoamericanodyssey.com/index.html>

27-30 October. The Geological Society of America National Meeting. Denver CO, USA “Celebrating Advances in Geosciences – Our Science, Societal Impact and Unique Thought Processes”. General information: <http://www.geosociety.org/meetings/>.

27-30 October. ISCCCL & CIIC Meetings and Symposium, Canberra Australia. Symposium topic: “Cultural Landscapes and Cultural Routes in the 21st Century, Issues and Opportunities”. General information: <http://www.aicomos.com/2013-canberra-centenary/>

28 October -1 November. DIGITAL HERITAGE 2013 International Congress. Marseille, France. General information: <http://www.digitalheritage2013.org>

31 October- 3 November. “Imagined pasts..., imagined futures” AUSTRALIA ICOMOS 2013 National Conference. Canberra, Australia. General information: <http://www.aicomos.com/2013-canberra-centenary/>

20-23 November. American Schools of Oriental Research Annual Meeting. Baltimore, MD USA. General information: <http://www.asor.org/am/index.html>

20-24 November. American Anthropological Association 111th Annual Meeting. “Future Publics, Current Engagements” Chicago, IL USA. General information: <http://www.aaanet.org/meetings/>

9-13 December. American Geophysical Union Fall Meeting, San Francisco, CA USA. General information: <http://www.agu.org/meetings/>

1-4 December. Australian Archaeological Association Annual Conference, Australia. General information: <http://www.australianarchaeology.com/conferences/aaa2013-conference/>

2014

7-12 January. Society for Historical Archaeology Conference Montreal, Canada. General information: http://www.sha.org/meetings/annual_meetings.cfm

2-6 March. Pittcon Conference and Expo, Chicago, IL USA. General information: <http://www.pittcon.org/>

16-20 March. 247th National Meeting and Exposition, American Chemical Society. Dallas, TX USA. General information: <http://www.acs.org>. Special session: ACS Archaeological Chemistry Symposium

9-13 April. American Association of Physical Anthropologists Annual Meeting. Knoxville, TN, USA. General information: <http://physanth.org/annual-meeting/82nd-annual-meeting-2013>

23-27 April. Society for American Archaeology. 78th Annual Meeting, Austin, TX, USA. General information: <http://www.saa.org/Default.aspx?TabId=1419>

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

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