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ARCHAEOLOGICAL SCIENCE FOR THOSE OUTSIDE ARCHAEOLOGY

Several articles have been published recently discussing the contributions archeometric studies have made to other academic fields and to the public at large. For example, Michael E. Smith asks "Just How Useful is Archaeology for Scientists and Scholars in Other Disciplines?" in his article appearing in the September 2010 issue of *The SAA Archaeological Record*. In the most recent volume, 10(3), of the *Journal of Social Archaeology*, Chip Colwell-Chanthaphonh and T.J. Ferguson discuss "Bridging Archaeological Science and Traditional Knowledge." These authors, and many others, are delivering commentaries on what they feel others can learn using archaeological science as well as how that knowledge can be applied.

A "Children's Science Educational Toy Kit" sold by National Geographic reflects how archaeological science is seen by those outside the field.

It seems that this is a salient conversation to have in these times of budget reductions and the clamor for financial accountability. Certainly those of us working in the laboratory or out in the field understand the need for basic science and feel strongly about the importance of comprehending behaviors of people in the past. The same may not be said of our peers in academic offices down the hall or people from outside the campus. They may not see the significance of what it is that we do. It doesn't help the matter when we couch our claims in specialized jargon or cryptic references.

One way to justify our interests is to make connections. Archaeologist have a long history of borrowing tools and techniques from other disciplines and occupations – Willard Libby won a Nobel Prize in Chemistry for his work on radio-carbon studies and the Marshalltown trowel is designed for masonry contractors. We need to further our collaboration with colleagues outside our own fields, offer them insights and new techniques. This willingness and ability to work well with others, learned long ago in our early grade school years, is what distinguishes archaeological scientists. Yet we should move beyond the standard links with chemistry, geology, and metallurgy. Talk with a social scientist, someone in the humanities, members of descendent communities, or an avocational group. See how their experiences can aid in your understanding of your own research problems. These connections may lead to a new project, an enhanced viewpoint, or even an additional source of funding.

Several examples of collaboration can be found within these pages. Read the article by Spandl to see how changes in agricultural practices affect the recovery of artifacts. See the fellowships offered to professionals in several fields. Consider attending a meeting in a specialty outside your own. Make an effort to expand your professional and social network, as these new branches could bear fruit.

Jay VanderVeen, Editor

IN THIS ISSUE

ANNOUNCEMENTS

Post-Doctoral Research Fellow in Archaeology focused on "Ceramics before Farming: Prehistoric Pottery Dispersals in Northeast Asia" at the Department of Archaeology, School of Geosciences, University of Aberdeen, UK. The School of Geosciences is one of three Schools within the College of Physical Sciences, University of Aberdeen. The School covers the disciplines of Archaeology, Geology & Petroleum Geology, Geography & Environment, and Spatial Planning & Rural Surveying.

From the department: "As part of a new international project funded by the UK Leverhulme Trust we are looking to appoint a Post-Doctoral Research Fellow in Archaeology. The successful candidate will play a central role in an international research team and will be responsible for coordinating analysis of early ceramic assemblages from across Northeast Asia in order to address key debates in archaeology about the origin and dispersal of early pottery technologies among prehistoric hunter-gatherers. Primary assemblage work will be completed at research centres in Japan and the Russian Far East, with analytical work including thin section petrography, geochemistry and organic residue analysis conducted back in the UK/EU. Applicants should possess advanced postgraduate training in archaeomaterials, and be able to demonstrate expertise in the multi-disciplinary analysis of pottery assemblages. This is a 3-year FT post. Annual Salary: £ (Sterling) 29,853.00."

Informal inquiries can be sent to Dr. Peter Jordan (Project PI) at peter.jordan@abdn.ac.uk or at (+44) (0) 1224 273374. Applications can be found at http://www.abdn.ac.uk/jobs/index.php

The University of South Florida is pleased to announce the third year of its ***Postdoctoral Scholars*** program in the Social Sciences and Humanities. The over-arching theme for this year's scholars is Global Change in a Dynamic World: Past, Present, & Future. Potential themes include (but are not limited to) sustainability and sustainable development; disaster management; population changes; technology and information issues; communication and language development; cultural diasporas; ethnicity, gender, and aging issues; cultural heritage and identity; health, economic, education, and environmental disparities; ethics; human rights; peace and conflict studies; injury and violence; security issues. Specific research and geographical areas are open, and applicants may consider both past and contemporary questions.

Postdoctoral Scholars will: (i) contribute to one or more of the priority goals of the strategic plan; (ii) work closely with distinguished faculty; (iii) participate in interdisciplinary and programmatic seminar series; (iv) teach one course each semester; and (v) continue to build an independent research record and engage in publishing refereed articles and creative scholarship. Three postdoctoral scholarships will be awarded in the 2011-12 academic year with appointments beginning August 8th 2011. Appointments are for full time employment (40 hours per week) and will be continued for a maximum of 2 years contingent on satisfactory performance. The salary is $40,000 per year and the University contributes to a health insurance program for postdoctoral scholars and their dependents (up to $5,000). Support for travel to academic conferences will also be available. Scholars will be responsible for relocation and housing expenses.

Applicants must have a doctoral degree in one of the following disciplines: Anthropology, Communication, Economics, English, Geography, Government and International Affairs, History, Philosophy, Sociology or an affiliated program, earned no earlier than 2008. Candidates who will have successfully defended their dissertations by May 1, 2011 will also be considered, however the doctoral degree must have been conferred prior to the first day of employment. Note: applicants must have received their doctoral degree from an institution other than the University of South Florida. Letters of application and supporting material must include the following: 1. a cover letter stating your interest in this Postdoctoral Initiative. It must provide details on (i) how your research and teaching expertise would contribute to the theme of Global Change in a Dynamic World: Past, Present, & Future and the goals and aspirations of the USF Strategic Plan (http://www.ods.usf.edu/plans/strategic/); (ii) the department or departments with which you would like to be affiliated; (iii) your teaching experience and courses that you would like to offer; and (iv) your long-term goals, a C*urriculum Vitae*, 3. two letters of reference, 4. scanned copies of up to three of your published papers/scholarly works or book chapters (maximum of 3), and 5. scanned copies of current academic transcript from all degree awarding institutions. Send all application materials to: postdoc@grad.usf.edu by December 10th, 2010.

The 2nd Society for Historical Archaeology (SHA) ***pXRF Symposium*** will be held in Austin, Texas in January 2011 and the 1st Society for American Archaeology (SAA) ***pXRF Symposium*** will be held in Sacramento, California in March of 2011. Together, over 20 presentations on the use of pXRF and other field portable and laboratory archaeochemical technologies for understand prehistoric, historic and classical sites. The presentations will be on a wide range of topics from a varied group of international investigators. Participants of each of these conferences are urged to bring materials for free pXRF analysis. These analyses will be performed at the SHA Archaeochemical Workshop and at a similar opportunity at the SAA meeting.

Additionally, SAS members are welcome to participate in a combination Caribbean cruise and field trip to Wondjina Research Institute project sites in Jamaica and Cozumel, Mexico. The seven day (January 9-16) cruise is described as informal and inexpensive. For more information, please feel free to contact Dr. Claudia Brackett or Mr. Richard Lundin at countrychemist@yahoo.com or wondjina@sonic.net.

The ***GIS 20: Essential Skills*** book has been published by ESRI press. This book is perfect for those just getting into geographic information systems (GIS), those who have limited training budgets or those who would just like to know how to create the most common types of maps or perform the most essential GIS functions. To view the table of contents and download a sample chapter visit http://esripress.esri.com/display/index.cfm?fuseaction=display&websiteID=176&moduleID=0

In a recent press release here is what ESRI says about the book: "The *GIS 20: Essential Skills* by Gina Clemmer is an indispensable workbook that helps readers master the top 20 skills that are necessary to become proficient in using ArcGIS software. The book is a direct result of a survey that Clemmer recently conducted with geographic information system (GIS) professionals to quantify the primary skills that are needed to be a successful GIS user. Each of the 20 chapters covers a specific topic related to the essential GIS skills Clemmer determined from the survey, including creating map layouts, preparing data, joining data to maps, working with attribute tables, mapping addresses, querying location, and publishing maps. The book also includes a data CD for completing the exercises."

Finally, please visit the SAS blog (http://socarchsci.blogspot.com/#uds-search-results) and the SAS wiki (http://sites.google.com/site/saswiki/) for all the latest news and positions.

MINIMISING FARMING EFFECTS ON ARCHAEOLOGICAL REMAINS

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Oxford Archaeology and Cranfield University, UK, have just completed an important project, funded by Defra and English Heritage, looking at the identification of soil cultivation practices to minimise the impact on archaeological sites. The results and recommendations of this project are of interest not only to geoarchaeologists and the wider archaeological community, but also to land managers and soil conservationists.

Damage from modern arable farming practices happens in a number of ways: the mouldboard ploughing of previously uncultivated grassland; the deeper than usual cultivation of crops such as sugar beet and potatoes and finally practices to improve soil structure and drainage such as subsoiling and mole drainage. More subtle damage also takes place, like the erosive effect of repetitive cultivation - nominally "to the same depth", the encroachment of ploughing over a number of years into the edges of archaeological sites, and the thinning of soil caused by water, wind and cultivation erosion. Other problems include displacement of archaeological artefacts, and physical and chemical damage caused to them, and the loss of waterlogged and palaeoenvironmental remains by the lowering of the water table through field drainage and erosion.

However, there is very little empirical data identifying how damage is caused, at what rate, and how best it can be minimised, without taking fields containing archaeological sites out of cultivation altogether. In order to address these issues a series of experimental studies was established on the Silsoe Farm of Cranfield University.

Studies were undertaken to look at sub-soil pressures resulting from tillage implements and vehicle loads and the effects that these could have on archaeological artefacts. These were undertaken both in the Soil Bin Laboratory at Cranfield University (see Figure 1) and outside in real field conditions. The lowest breakage threshold value recorded in the soil bin laboratory experiments using replica historic pots (see Figure 2) would have been exceeded by the pressure below the plough soil from most everyday arable procedures. Higher moisture contents accounted for up to a 0.25 bar increase in pressure transfer. Mouldboard ploughing caused more pressure transference below ground than non-inversion tillage techniques.

Figure 1. Soil bin at Cranfield University, showing the tyre rig set to exert a specific pressure and the re-excavation of artefacts after one pass of the rig.

Studies in the field to examine the effects of primary cultivation systems were also carried out by laying out a series of specially constructed archaeological sites, which provided a known baseline to accurately record levels of damage (see Figure 2). Both deep (0.20-0.25 m) and shallow (0.125 m) mouldboard ploughing led to the truncation of archaeological sites over time despite the reinstated ploughsoil being 0.25-0.30 m deep.

Figure 2. Replica pt, after re-excavation, showing sensor wires and conductive paint that record breakage pressure while the pot was buried.

Differing rates of archaeological truncation were recorded: accelerated deep mouldboard plough plots, where 30 years worth of cultivation was undertaken over a three year period, caused 0.10 m of truncation - 0.003 m a year; accelerated shallow mouldboard plough plots caused 0.07 m of truncation to the archaeological sites over 30 years of accelerated cultivation in the three year time-frame - 0.002 m a year. Real-time deep mouldboard plots 0.03 m over three years - caused 0.01 m of truncation to the archaeological sites a year (this faster rate may indicate an initial period of settling). The effect of subsoiling was also examined and was seen to cause considerable and sustained damage to the archaeological features.

Truncation of archaeological sites over time is likely to be caused by a combination of gradual long term truncation through the difficulties in maintaining an exact plough depth (especially if working at a restricted depth). Soil movement created by the forward movement of the plough and more dramatic truncation through cultivation when moisture levels are high are also significant factors. The use of minimal till/non-inversion and direct drill techniques caused no damage to the archaeological sites (see Figure 3).

Figure 3. Ridge and furrow after non-inversion tillage using the Simba Solo. This shows how the wavelength of the earthwork has protected the furrows from disturbance and how material from the ridges is beginning to fill these furrows up.

Based on these results a number of suggestions were made to prevent damage to archaeological sites in arable land; the most important being that inversion tillage (i.e. any form of mouldboard ploughing) should not be carried out on flat sites.

However, one of the key stumbling blocks to introducing non-inversion tillage agriculture is the perceived need for subsoiling to accompany these techniques to prevent the build up of pans and deep soil compaction. The project therefore also studied the relationship between tractor passes and soil compaction and degradation over the accelerated 30-year period.

The study shows little development of compaction pans away from the wheel passes in any of the plots including the direct drill and non-inversion tillage, even after 30 years of accelerated primary and secondary tillage (carried out in the three year time-frame), providing there has not been random wheelings over the soil. Both conventional and shallow ploughing operations are likely to reduce the natural soil strength and make soils more vulnerable to compaction than non-inversion techniques.

A series of suggestions has also been made to ensure that pressure transference from agricultural machinery does not cause risk to archaeological sites. Ways in which compaction over a field containing archaeological deposits can be avoided include using controlled trafficking, keeping heavier loads off site and using wide section or dual tyres at safe lower inflation pressures commensurate with the load and duty cycle (or tracks) to minimise pressure transference.

Key to reducing risks from pressure and preventing the formation of compaction pans is avoidance of archaeological sites at times when moisture contents exceed field capacity. If the suggestions discussed in this document and Defra's Good Soil Management Code of Practice (2009) are adhered to then the formation of compaction pans will be minimised and therefore the need for subsoiling can be reduced significantly. In areas of the controlled traffic/wheelings where compaction is seen then shallow loosening can be applied to remove this, to a depth that does not exceed 0.30 m.

This work provides practical measures which will now inform policies of heritage protection, arising from developments in heritage legislation and allow informed management suggestions to be made. The results of this work will also be critical for those involved in providing management advice for archaeological sites in arable landscapes, including Natural England and English Heritage. It provides them with tried and tested suggestions based on actual results, rather than hearsay, which can be discussed with farmers and other land managers and implemented through agri-environment schemes. It also re-enforces the importance of adhering to the principles of good soil management which help to sustain good agricultural practices by minimising compaction and promoting crop growth, promoted by soil conservation and sustainable farming bodies.

References

Defra (2009). Good Soil Management Code of Practice (http://www.defra.gov.uk/foodfarm/landmanage/cogap/)

ARCHAEOLOGICAL CERAMICS

Charles C. Kolb, Associate Editor

The column in this issue includes six topics: 1) Robert L. Rands; 2) Reviews of Books on Archaeological Ceramics; 3) Online Resources; 4) Previous Meeting; 5) Forthcoming Meetings; and 6) Exhibitions.

The Passing of Robert L. Rands

Robert L. Rands (13 May 1922-24 July 2010) earned his B.A. from the University of New Mexico, an M.A. from UCLA, and received his doctorate from Columbia University in 1952; his dissertation was *Some Evidences of Warfare in Classic Maya Art*. He received the Society for American Archaeology's "Award for Excellence in Ceramic Studies" in 1998. The citation reads: "Robert L. Rands -- This year's Award for Excellence in Ceramic Studies goes to Robert L. Rands, who has contributed to ceramic studies for almost five decades. Throughout his career, he has conceived of ceramic studies in multi-dimensional terms and contributed to both theoretical and methodological aspects of ceramic analysis. Rands presented his first paper on the ceramics of Palenque at the 1952 SAA meeting and participated in the seminal Maya Lowlands Ceramics Conference in 1965. During those years he focused on spatial analysis as a basis for inferences about centralization in early state societies and examined variability in natural resources, relating their use to production and trade issues. In subsequent years, Rands pioneered the study of compositional approaches to ceramic studies in order to address questions of regional exchange and interaction. His research on the ceramics of Palenque represents a culmination of this multidimensional approach. Although Rands's research has focused on the Lowland Maya, his articles in the Handbook of Middle American Indians remain key references on Highland Maya pottery and figurines. SAA commends Rands for his long and productive career and the many innovations to ceramic analysis that he has introduced into the field."

These are his major publications on ceramics: Bishop, R. L., Rands, R. L., and Holley, G. R. (1982) Ceramic compositional analysis in archaeological perspective. In Schiffer, M. B. (ed.), *Advances in Archaeological Method and Theory*, Vol. 5, Academic Press, New York, pp. 275-330. Bishop, R. L., Rands, R. L., and Harbottle, G. (1982) A ceramic compositional interpretation of incense-burner trade in the Palenque area, Mexico. In Currie, L. A. (ed.), *Nuclear and Chemical Dating Techniques: Interpreting the Environmental Record*, American Chemical Society, Washington, DC, pp. 411-440. Rands, R. L. (1967a) Ceramic technology and trade in the Palenque region, Mexico. In Riley, C. L., and Taylor, W. W. (eds.), *American Historical Anthropology*, Southern Illinois University Press, Carbondale, pp. 137-151. Rands, R. L. (1967b) Cerámica de la región de Palenque. *Estudios de Cultura Maya* 6: 112-147. Rands, R. L. (1968) *Notes on the Ceramic Sequence at Palenque, Chiapas*. Unpublished mss. archived at the University Museum, University of Pennsylvania, Philadelphia. Rands, R. L. (1974)The ceramic sequence at Palenque, Chiapas. In Hammond, N. (ed.), *Mesoamerican Archaeology: New Approaches*, Duckworth, London, pp. 51-75. Rands, R. L. (1988) Least-cost and function optimizing interpretations of ceramic production: An archaeological perspective. In Kolb, C. C. (ed.), *Ceramic Ecology Revisited, 1987: The Technology and Socioeconomics of Pottery*, British Archaeological Reports International Series S436, British Archaeological Reports, Oxford, England, pp. 165-198. Rands, R. L. (1991) The intellectual development of Mesoamerican archaeology and an assessment of Shepard's influence. In Bishop, R. L., and Lange, F. W. (eds.), *The Ceramic Legacy of Anna O. Shepard*, University Press of Colorado, Niwot, CO, pp. 154-173. Rands, R. L., and Bishop, R. L. (1980) Resource procurement zones and patterns of ceramic exchange in the Palenque Region, Mexico. In Fry, R. (ed.), *Models and Methods in Regional Exchange*, SAA Papers 1, Society for American Archaeology, Washington, DC, pp. 19-46. Rands, R. L., Bishop, R. L., and Sabloff, J. A. (1982) Maya Fine Paste ceramics: An archaeological perspective. In Sabloff, J. A. (ed.), *Excavations at Seibal: Analysis of Fine Paste Ceramics*, Memoirs of the Peabody Museum of Archaeology and Ethnology. Vol. 15(2), Harvard University, Cambridge, pp. 315-343. Rands, R. L., and Weimer, M. B. (1992) Integrative approaches in the compositional characterization of ceramic pastes. In Neff, H. (ed.), *Chemical Characterization of Ceramic Pastes in Archaeology*, Monographs in World Archaeology 7, Prehistory Press, Madison, WI, pp. 31-58. More recently, he published reports in the FAMSI (Foundation for the Advancement of Mesoamerican Studies, Inc.) electronic archive: *Palenque and Selected Survey Sites in Chiapas and Tabasco: The Preclassic* (2002) http://www.famsi.org/reports/97032/ and http://www.famsi.org/reports/97032/section08.htm and a Spanish translation (2005) *Palenque y otros sitios seleccionados para su estudio en Chiapas y Tabasco: el Preclásico*, http://www.famsi.org/reports/97032es/section08.htm

Book Reviews

Pots, People, and Politics: A Reconsideration of the Role of Ceramics in Reconstructions of the Iron Age Northern Levant, Matthew R. Whincop, British Archaeological Reports International Series S1902, Oxford: Archaeopress, 2009. xx + 408 pp.; 71 tables, 105 charts, 5 seriation matrices, 8 dendrograms, 54 figures, 91 maps, list of abbreviations (n = 14), and bibliography; 2 data Appendices and data CD. ISBN 9781407303840, £70.00 (paper). Whincop received his doctorate from the Department of Archaeology, University of Durham, UK, subsequent to his M.A. (Research) and B.A. Honors (Melbourne), and has been appointed as a Visiting Research Fellow for a period of three years from 1 August 2009 at Durham. He previously authored "The Iron Age II at Tell Nebi Mend: Towards an explanation of ceramic regions," *Levant* 39:185-212 (June 2007). The monograph under review derives from his Masters research on Iron II pottery from Tell Nebi Mend and uses the ceramic material culture of the Northern Levant to inform an archaeological reconstruction of Iron Age society. He also reconsiders current reconstructions of the Iron Age Northern Levant and the role that ceramics

studies have played in these interpretations. He presents a regional ceramic typology for the Iron Age (including the Persian period) and provides an analysis of the distribution patterns of this typology across the Northern Levant. Whincop proposes an alternative interpretation of the ceramic data and compares this with the conventional historical model. His alternative reconstruction focuses on theories of practice and foodways in the context of "the dynamic manner by which material culture is used to constantly negotiate and consolidate social structures. In the end, the study offers one perspective on the compatibility of archaeological data and the historical text, and makes some final recommendations for their correlation." The "Bibliography" (pp. 237-281) contains 1,428 references and lists 8 Internet resources. The CD (in a plastic pocket at the back of the book) contains the following: Charts, Clusters, Database, Distribution Maps, Seriation, Site Data, and Type Data. Following an introductory essay (Chapter 1), the author has organized the other nine chapters into four sections.

"Chapter 1: Introduction" (pp. 1-3). Whincop notes that the pottery from the inland site of Tell Nebi Mend (TMN) had a number of distinctive "regional" variations that were difficult to reconcile with the conventional history of the Iron II period: TNM cooking pots resembled those from the coast, large pithoi were linked to the interior, and an "inland form" (Red-Slip Ware pedestal-platter) had a locally-restricted distribution. These "mixed influences" implied a two-region model but did not explain all aspects of the material culture patterning, suggesting a political and cultural homogeneity within these two broad regions. The question he poses is: was TNM unique or whether such a complex ceramic patterning might be a more widespread feature. Whincop then lays out four distinct tasks to resolve the quandary: 1) demonstrate how the conventional historical narrative has been employed to determine interpretations of the archaeological record; 2) develop a comprehensive and reliable ceramic typology for the Iron Age of the Northern Levant; 3) identify broad and specific patterns in the distribution of Iron Age pottery across the Northern Levant; and 4) determine whether the observed ceramic patterning is compatible with the conventional historical narrative.

"Section One: Current Theory, Method, and Practice in Reconstructions of the Iron Age Northern Levant" (Chapters 2-4) provides context for the study by examining the historical framework that lies behind current reconstruction of the Iron Age Northern Levant. "Chapter 2: The Imposition of Predetermined Frameworks onto the Archaeological Record" (pp. 7-34, 7 tables, 2 charts) is an essay that demonstrates that current reconstructions of Iron Age society bear little resemblance to the archaeology of that region. Whincop presents and challenges major concepts behind these inferences and points out the fragile foundations and premises on which they rest. Historical narratives, he points out, have been used to "over determine interpretations of archaeological record" – in essence historical function has replaced archaeological facts and he is determined to provide a new paradigm based on data. Refreshingly, he examines European perspectives on the Near East and show how these influenced current perspectives on societal reconstruction. In "Chapter 3: Critical Review of Iron Age Excavations" (pp. 35-87, 57 tables), he examines the impact of this historical interpretive framework on the practice of archaeology in the northern Levant. To do this, Whincop reviews and sets up a critique of the methods and societal interpretations (e.g., sociocultural and economic inferences) from 47 Iron Age excavations (listed in Appendix A) that have been undertaken in the northern Levant. The distribution of the site locations are: Syria (n = 20), Lebanon and Israel (10 each), Turkey (6), and Lebanon (1). The assessment and critique appear in "Chapter 4: Approaches to Iron Age Pottery from the Northern Levant" (pp. 88-95, 1 table, 2 figures), which focuses on Levantine Iron Age ceramics. He notes "recurring themes" in Near Eastern ceramic studies and questions the theoretical underpinnings, and provides a sobering evaluation showing that the historical narrative has "penetrated an understanding of material culture." By way of comparison, he also looks at two ceramic studies from the Near East and reviews alternative ways for examining the relationships between the people, their society, and material culture. The two are Stefania Mazzoni's work at 1st millennium BCE Tell Afis in which she employs a cross-cultural perspective and develops "ceramic provinces" and Gunnar Lehmann's research on the Iron Age and Persian period (8th to 4th centuries BCE) in which he developed a coastal-inland dichotomy. Lastly, Whincop addresses the implications that these alternative methods have for the practice of archaeology in the Levant.

"Section Two: Presentation of Iron Age Ceramic Data" (Chapters 5 and 6) provides an overview of the ceramic data that Whincop collected on 12,000+ published and unpublished Iron Age vessels from 54 sites. "Chapter 5: Form and Nature of the Ceramic Data" (pp. 99-108, 9 charts, 3 figures) provides information on these vessels from sites in the Northern Levant, Southern Levant, Coast, and Beqa' (8,000 "incidents") and 600 different contexts. The accompanying CD provides tabular data on sites (ARCGIS) and contexts, vessel rims (193 classes are identified), and his main data table. Data was entered in MS Access and the Bonn Archaeological Software Package version 5.43 for Windows (Win BASP v. 5.43) and he also considers vessel functions and functional categories in this chapter for periods Iron I, II, II, and the Persian period. A key consideration, he points out "is the imperfect nature of the data which required the present study to rely upon presence/absence information." "Chapter 6: Typological Patterns in the Data" (pp. 109-152, 1 table, 54 figures) details a three-tiered structure of functional categories, classes, and subclasses. The author characterizes descriptions, distinctions (unique traits), bases, surfaces (decorations), attachments (appendages and supports), distribution, parallels, and comments. Next, he describes 16 typological patterns comprising a total of 193 classes); these patterns are (number of classes in parentheses): cooking-pots (10), miscellaneous utilitarian (5), transport amphorae (15), pithoi (7), kraters (19), storage amphorae and urns (9), spouted amphorae (2), jugs (32), juglets (1), flasks (2), unguent containers (2), spouted jugs (8), bottles (8), Assyrian bottles and cups (1), cups and chalices (12), and bowls (59).

"Section Three: Analysis of Iron Age Ceramic Data" (Chapters 7 and 8) begins with "Chapter 7: Exploratory Data Analysis"

(pp. 153-194, 3 tables, 72 charts) in which he summarizes his study of the assembled data under five headings: temporal analysis, spatial analysis, functional analysis (vessel forms and functions), mortuary analysis, and decoration analysis. In "Chapter 8: Multivariate Data Analysis" (pp. 195-217, 22 charts, 8 dendrograms [in color]) Whincop considers two analytical techniques: correspondence analysis and cluster analysis. He focuses on correspondence analysis, initially explaining the technique, and his analysis includes a study of: 1) broad patterns, 2) localised geography, 3) general chronological features, 4) mortuary assemblages, and non-mortuary assemblages. The latter is subdivided into general trends, period specific assemblages, period specific functions, and type of non-mortuary content (Tell Afis).
He performs cluster analysis, first discussing the technique and then presenting an evaluation of his eight clusters: 1) cooking-pots; 2) transport amphorae; 3) pithoi; 4) kraters; 5) urns; 6) jugs, flasks, and spouted vessels; 7) bowls; and 8) mortuary and non-mortuary.

"Section Four: An Alternative Reconstruction for the Iron Age Northern Levant" (Chapters 9 and 10) starts with "Chapter 9: Ceramics and Identity in the Iron Age of Syria" (pp. 221-233, 1 table) in which the author examines sociocultural implications of patterns discerned from the assembled data. An alternative reconstruction of Iron Age material culture is the focus of his presentation. He begins with a consideration of categories of use which are characterized under four major headings: 1) transport and trade, 2) storage, 3) domestic appliances, and 4) conspicuous consumption. The latter has subgroups: serving food, drinking (Iron I with Aegean influence, Iron II-III with Red-Slip Ware, and Iron II-Persian period with Greek pottery imports), unguent containers, mortuary assemblages (with discussions on drinking within mortuary contexts and storage in mortuary contexts), and "Assyrian Wares." A subsequent part of the chapter examines "Complexity and Diversity in Iron Age Northern Levant" (pp. 230-232) with separate considerations of Iron I, Iron I and II, and Persian periods. Whincop's sections on historical considerations and the summary and implications are brief (a few paragraphs) but he challenges the conventional historical construction of Iron Age Northern Levant. In "Chapter 10: Conclusions" (pp. 234-235, 1 table) the author critiques the fragile foundation of Iron age chronology, discusses the importance of Red-Slip pottery, and the linking of early Iron Age-style pottery with the "Sea Peoples." His reassessment of the region's archaeology has led to the construction of a region-wide ceramic typology followed by the identification and description of numerous patterns discerned from the ceramic data. The implications of these data led to his alternative reconstruction of Iron Age Northern Levant. He proposes several avenues for future research, including a more systematic ordering of site data, and discusses the Bronze-Iron Age transition and proposes a revision that he sees as a platform for future research.

The "Bibliography" (pp. 237-281) contains an astonishing 1,428 entries plus 8 Internet resources. This is likely the most thorough compilation of Iron Age citations on excavations and ceramics from this region of the eastern Mediterranean. The remainder of the printed volume includes: "Appendix A: Gazetteer of North Levantine Iron Age Sites" (pp. 285-301, 52 sites); "Appendix B: Iron I CLASSES and Late Bronze Age Examples" (p. 302, cited on the Table of Contents but the page is blank in the printed monograph); "Figures" (pp. 303-358, 54 figures); and "Maps" (pp. 359-408, 91 maps [in color]).

An astounding amount of detailed statistical and documentary information is found on the accompanying CD. Seven groupings include 1) 22 Charts (in color); 2) 9 Clusters of pottery forms etc. (amphorae, bowls, cooking vessels, kraters, mortuary vessels, pithoi, settlement data, and urns; in black-and grey with an accompanying zoom feature); 3) 580+ Distribution Maps (in color, also with a zoom feature); 4) 5 Seriation files (in color and with a zoom feature); 5) 1,300+ Database files (in black-and-white); 6) Site data (75 pp. in tabular form as a Word document); 7) and Type data (172 pp. in tabular form as a Word document).

This thoughtful reassessment of ceramics materials and historic and sociocultural-socioeconomic interpretations for Iron Age I, II, and III and the Persian period in the Northern Levant (primarily modern Syria, Lebanon, and Israel) is significant to the region but Whincop's innovative methodology bears a close look by any researcher who deals with ceramics from multiple chronological periods within large geographic areas. It is significant that this important assessment is illustrated throughout with maps, plans, figures, drawings and photographs. Among the 75 or so volumes devoted to ceramics that have been published in the British Archaeological Reports International Series, I cannot recall any that have included a CD containing databases, charts, maps, and seriation and site and type data. This study is an incredible achievement and should give us pause as to how other researchers approach their spatial and chronological ceramic data.

Ceramics in Transitions: Chalcolithic through Iron Age in the Highlands of the Southern Caucasus and Anatolia, Karen S. Rubinson and Antonio Sagona (eds.), Ancient Near Eastern Studies Supplement Series 27, Louvain, Belgium: Peeters Publishing, 2008. viii + 368 pp., ISBN: 978-90-429-1998-3, 90 €, $117.00, 7840 Rupees (hardback). Karen S. Rubinson is a Research Scholar in the Department of Anthropology at Barnard College, where she organizes international workshops on archaeological topics. She is also at present the President of ARISC, the American Research Institute of the South Caucasus, a recently founded American Overseas Research Center. Dr. Rubinson received her B.A. from Barnard College, and her graduate degrees from Columbia University, an M.A. in Oriental Art History and Archaeology, and she holds an M.Phil .and Ph.D. in Ancient Near Eastern Art History and Archaeology. Her 1976 Ph.D. dissertation at Columbia University was on the Trialeti Culture in the Caucasus. She has excavated in Turkey, Iran, and Armenia, and her research interests include the connections among the South Caucasus countries and adjacent areas, especially in the Bronze Age, and the steppe cultures of Eurasia in the Iron Age. The former interest resulted in two edited volumes *Archaeology in the Borderlands: Investigations in Caucasia and Beyond*, with co-editor Adam Smith (Los Angeles: UCLA Cotsen Institute of

Archaeology Press, 2003) and the current volume, *Ceramics in Transitions: Chalcolithic through Iron Age in the Highlands*, as well as many articles and papers. Her other interests are recently expressed in the edited volume *Are All Warriors Male? Gender Roles on the Ancient Eurasian Steppe* (with Katheryn M. Linduff, Lanham, MD: AltaMira Press/Roman & Littlefield Publishing, Inc., 2008). Rubinson has received fellowships and grants from many sources, most recently from the American Philosophical Society to study the silver objects excavated from Trialeti and housed in the S. Janashia State Museum of Georgia. Antonio (Tony) Sagona, who professes at the School of Historical Studies Centre for Classics and Archaeology, University of Melbourne, has over 25 years of experience in archaeological fieldwork, mostly in Turkey, where he co-directed, with Claudia Sagona, major projects at Sos Höyük and Büyüktepe Höyük. Presently, he is involved with two new major and long-term projects. One is in the Republic of Georgia, in the Caucasus, on the frontier between the ancient Near East and the Eurasian steppe lands, which seeks to examine the archaeology in the Iberian Plain. The other is an historical and archaeological survey of the ANZAC Battlefield area at Gallipoli. He has supervised to completion 21 Ph.D., 22 M.A., and over 50 B.A. (Honors) theses, and is currently supervising many others. Sagona has written five books, edited six others, and written numerous articles; he is also Editor of the journal *Ancient Near Eastern Studies*, and its monograph series, published by Peeters Publishers, in Leuven. He is an elected Fellow of the Society of Antiquaries of London, and a Fellow of the Australian Academy of the Humanities. He is the co-author of *Ancient Turkey* (with P. Zimansky, London: Routledge, 2009) and *Archaeology at the North-East Anatolian Frontier. Vol. 1. An Historical Geography and a Survey of the Bayburt Province*, (with C. Sagona, Louvain: Peeters Press, 2004); and the author of *The Heritage of Eastern Turkey: From the Earliest Settlements to Islam* (New York and Melbourne: Macmillan, 2006), *The Asvan Sites 3: Keban Rescue Excavations, Eastern Anatolia, The Early Bronze Age* (Monograph 18, London and Ankara: British Institute of Archaeology at Ankara, 1994) and *The Caucasian Region in the Early Bronze Age*, 3 vols. (British Archaeological International Series 214, Oxford: British Archaeological Reports, 1984).

The papers in this volume, are drawn from the International Workshop on Archaeological Ceramics in the Southern Caucasus and Adjacent Areas held at Barnard College, Columbia University, and focus on archaeological ceramics excavated in Armenia, Azerbaijan (Nakhichevan and nearby areas), Georgia, Iran (western Azerbaijan) and eastern Turkey, areas which shared common cultures in the prehistoric past. They focus on three periods of transition: 1) the Chalcolithic to the Early Bronze Age, the end of the fourth and beginning of the third millennium BCE; 2) the period from the Early Bronze Age to the Middle Bronze Age, approximately the end of the third millennium BCE through the beginning of the second millennium BCE; and 3) the latter part of the second millennium BCE (archaeologically termed Late Bronze/Early Iron Age). The subjects of these include data from new excavations, new questions of old data, innovative technical studies and interactions among these lands and nearby areas such as the ancient Near East and beyond. The many color illustrations serve as an important reference for scholars and field researchers dealing with questions of local ceramic sequences and long-distance or regional contact and exchange. The volume also contains important tabulations of Carbon-14 data and extensive bibliographies.

Following the "Acknowledgements" (pp. vii) and "Introduction: A Question of Nomenclature" by Karen S. Rubinson and Antonio Sagona (pp. 1-7, 20 references cited, 13 footnotes) the volume is divided into three parts: The Chalcolithic and Early Bronze Age (four chapters), The Middle Bronze Age (four chapters), and The Late Bronze and Iron Ages (five chapters). The introductory essay pays homage to Frederick R. Matson who conceived of and chaired the "groundbreaking" 1961 Wenner-Gren Symposium "Ceramics and Man" (published as *Ceramics and Man*, New York: Wenner-Gren Foundation for Anthropology Research, Viking Fund Publications in Anthropology 41; Chicago: Aldine, Chicago, 1965). The editors also discuss terminology and naming conventions, and provide a context for the presentations which exemplify the "rich data" from this region.

The Chalcolithic and Early Bronze Age (four chapters): The initial contribution is "Late Chalcolithic Ceramic Cultures in the Anatolian Highlands" by Catherine Marro (pp. 9-37, 11figures [1 in color], 1 map, 32 references cited, 51 footnotes). Marro considers the period 4000-3500 BCE, discusses the archaeological data, and defines four assemblages: Late Sioni, Chaff-Faced Ware, Tilki Tepe, and Proto-Kura Araxes. She proceeds to review ceramic variations and distributions/locations, noting he lack of morphological and technological characterizations for the Proto-Kura Araxes and Late Sioni assemblages. The data suggests a complex settlement pattern and she concludes that there is a need to analyze these materials from a broader perspective. "Mid-Fourth Millennium Red-Black Burnished Wares from Anatolia: A Cross-Comparison" by Giulio Palumbi (pp. 39-58, 4 figures [3 in color, 1 map, 1 plan], 30 references cited, 34 footnotes) focuses on this ceramic described by B. Kuftin in 1941 and 1944 in southwestern Georgia and defined by Robert Braidwood in 1960 in Amuq Plain Phase G. Handmade Sos Höyük VA Red-Black Burnished Ware dates 3500-3000 BCE Red-Black Burnished Ware while handmade Arslantepe VIII and Central Anatolian Red-Black Burnished Wares date 3500-3400 BCE. Ceramic technology, typology, and diffusion are discussed. "The Chalcolithic to Early Bronze Age Transition at Baruj Tepe (Barı Qalasi), North-western Iran" by Karim Alizadeh (pp. 59-70, 5 figures, 1 map, 26 references cited, 19 footnotes) begins with a description of the site located in the Marand Plain and outlines the objectives of the archaeological survey. The author points our parallels with Kura Araxes ceramics and then describes the pottery in terms of color, function, and technological characteristics. Three chronological periods are discussed: Neolithic and Chalcolithic (41% of the ceramics), Early Bronze Age (51%), and Middle and Late Bronze Age (8%). In "Some Technical Aspects of the Pottery of the Early Bronze Age Site of Gegharot (Armenia)" by Armine Hayrapetyan (pp. 71-86, 7 figures, 2 tables, 21 references cited, 15 footnotes) the author discusses ceramics

from the final phase of Kura Araxes culture (dated to Early Bronze Age III in Armenia). There are "many" sites where agriculture and animal husbandry were practiced and ceramics manufactured. He describes the vessel shapes and chemical analysis which included 70 petrographic studies and 100 chemical-physical analyses and examination by binocular microscopy. Six distinctive paste groups are delineated and six technological attributes described.

The Middle Bronze Age (four chapters): In "The Pattern Burnished Ornament in Georgia During the Bronze Age" by Giorgi Bedianashvili (pp. 87-100, 4 figures, 1 table, 35 references cited, 30 footnotes) the author focuses on the southern Caucasus and eastern Georgia during the 4th and 3rd millennium BCE. Three periods are defined and characterized: Early Kurgan period (2nd half of the 3rd millennium BCE), Trialeti culture (2nd millennium BCE), and the subsequent Late Bronze Age. There are "some" affinities with painted decorations but the Georgian Pattern Burnished ceramics have their own distinctive motifs. "The Highland Plateau of Eastern Anatolia in the Second Millennium BCE: Middle/Late Bronze Ages" by Aynur Özfirat (pp. 101-121, 11 figures [3 in color, 2 maps], 53 references cited, 32 footnotes) begins with a discussion of the Middle Brone (sic.) Age dated to the early 2nd millennium BCE. There is a scarcity of sites in the eastern high plateau, but known sites are described. The Red-Brown wheelmade ceramics are recovered, in the main, from pillaged cemeteries; these burial wares have four categories of painted decoration executed in red-on-buff and black-on-red and are designated Araxes Painted Wares.
"The Pottery Traditions of the Armenian Middle to Late Bronze Age 'Transition' in the Context of Bronze and Iron Age Periodization" Pavel Avetisyan and Arsen Bobokhyan (pp. 123-183, 46 figures [1 chronological chart, 1 list of seven radiocarbon dates], 76 references cited, 35 footnotes) focuses on the period from end of the 3rd millennium BCE to the beginning of the Urartian period (786 BCE). Six archaeological groups are defined ending with Lchashen-Metsamor. The authors discuss briefly the settlements and burials but identify 15 typological groups of ceramics: Early Kurgan 1 and 2; Trialeti-Vanadzor 1, 2, and 3; Sevan-Arlsakh 1 and 2; Karmir-Berd; Karmir-Vank; and Lchashen-Metsamor 1, 2, 3, 4, 5, and 6. These are related to the available radiocarbon dates for the area. In "Didi Gora and Tqisbolo-Gora: Two Middle Bronze Age Settlements in the Alazani Valley, Kakheti, Eastern Georgia" by Gabriele Kastl (pp. 185-198, 4 figures [1 in color], 1 map, 13 references cited, 30 footnotes), Kakheti begins with a description of the two settlement mounds, the geography, excavations, and stratigraphy. The ceramics are primarily Black-Brown Burnished Ware sherds; one red-on-buff (in Layer 11) and one black-on-red (unstratified) sherds were recovered. The author concludes that the excavation and ceramic analyses helps to fill in the archaeological picture of southern Caucasia.

The Late Bronze and Iron Ages (five chapters): "Ceramics of Tqisbolo-gora, Georgia: Second and First Millennia BCE Horizons" by Ute Goehring (pp. 199-233, 17 figures [1 map, 1 plan, 6 tables], 11 references cited, 23 footnotes) commences with a discussion of the archaeological sites, the prehistory, and ceramics from eastern Georgia. The site of Tqisbolo-gora is located on the west side of the Alazan River near the village of Karadze. The author reports on the excavation of six 10 x 10 m units and describes the archaeological features and the stratigraphy that were revealed. The characteristics of the ceramics recovered are detailed; vessels forms included: pots, cylindrical necked vessels, handled pots, wide-mouth bowls, pitchers, beakers, cups and six other forms. Three base forms and handles are also described. Decoration included notching, incision, and pattern burnishing; there is no painting. Goehring also discusses the site and ceramic assemblage in relation to other sites. In "Ubadno (Eastern Georgia) -- Three Radiocarbon-Dated Settlements from ca. 1000 BCE: A Report on the Ceramic Analysis" by Jan-Krzysztof Bertram (pp. 235-266, 16 figures [including 1 map, 4 plans, 1 chronological table], 29 references cited, 33 footnotes) the focus is on the excavation and features of three settlements (Ubadno I, II, and III). The analytical methods are reviewed and vessel forms and decorations described, and technological characteristics discussed. Seventeen radiocarbon dates are related to the ceramic relative chronology and geomagnetic measurements are provided.

"Recent Investigations at Pulur (Erzurum): Observations on Northeast Anatolian Ceramics" by Mehmet Işikli (pp. 267-289, 7 figures [2 maps, 1 chronological table], 35 references cited, 30 footnotes) begins with a description of the geographic setting and history of excavations at the site of Pulur. The author analyzed about 300 sherds obtained from the "reinvestigation" of this previously excavated site. In "The Transition from Late Bronze Age to Early Iron Age in the Upper Tigris Region, Southeastern Anatolia: Identifying Changes in Pottery" by Gülriz Kozbe (pp. 291-322, 22 figures [3 in color, 2 maps], 34 references cited, 31 footnotes) survey and excavation undertaken 2000-2003 revealed a chronology from Late Chalcolithic to the Middle Ages. The focus of the presentation is on Middle Assyrian (1295-1056 BCE) pottery: Handmade Grooved, Upper Tigris Grooved, and Early Iron Age (painted pottery is a minor component of the latter). Unbaked clay tablets dated 1068-1056 BCE are also noted. The final contribution is "Ancient Colchian Pottery from Georgia" by Joni Apakidze (pp. 323-368, 19 figures [2 maps], 139 references cited, 119 footnotes). The emphasis is on the Late Bronze to Early Iron Age in Western Georgia (1500-700 BCE) and associated Colchian culture and ceramics. Apakidze discusses the local variants of this pottery and proposes a new classification of Colchian pottery for Western Georgia and critiques five previously developed typologies and chronologies. There is also a brief discussion of Proto-Colchian ceramics and the distribution of Ancient Colchian pottery which is found in settlements on the Black Sea coast.

The contributions in this handsome volume are well-edited and the splendid illustrations are critical to understanding the pottery in the Caucasus and nearby areas. The color illustrations are magnificent. The editors deserve high praise for arranging and conducting the workshop and overseeing the publication of these papers which establish a seminal baseline for future archaeological and ceramic studies in an important region that is relatively unknown to Western scholars. It is

anticipated that future studies will lead the way to contextual studies and additional scientific analyses of the ceramics from sites in this region in terms of loci of production and subsequent distribution. Armine Hayrapetyan's contribution, which includes physicochemical analyses, demonstrates what needs to be done as research progresses.

Breaking the Mould: Challenging the Past through Pottery, Ina Berg (ed.), Prehistoric Ceramics Research Group, Occasional Paper 6, British Archaeological Reports International Series S1861, Oxford: Oxbow, 2008. vi +123 pp., 91 figures (figures, maps, plans, drawings, and photographs, 15 tables, ISBN 9781407303444, £28.00. These papers are from the Third International Conference on Prehistoric Ceramics, entitled "Breaking the Mould: Challenging the Past through Pottery," held in October 2006 and hosted by the Department of Archaeology on behalf of the Prehistoric Ceramics Research Group and The Prehistoric Society at the University of Manchester. Financial assistance came from the British Academy and University of Manchester. More than 50 delegates from Britain, France, Belgium, The Netherlands, Sweden, Italy, and the Republic of Macedonia attended the conference. Ina Berg (University of Manchester) served as editor of these 11 presentations and wrote the initial essay, "Breaking the Mould – An Introduction" (pp. v-vi), and organized the papers into three groups: 1) advances in methodology (three papers), 2) issues of identity six contributions), and 3) the contribution of the sciences (two papers).

The three papers in the first group focus on data collection and analyses. In "Skill amongst the sherds: Understanding the role of skill in the early to late Middle Bronze Age in Hungary" by Sandy Budden, University of Southampton (pp. 1-16, 7 figures, 6 tables, 105 references), the author focuses on learning strategies, the acquisition of skills, and procedural knowledge. The presentation is related to her doctoral research. In addition to the social nature of learning, she considers the technological signatures of production and factors in skill variability. She discusses the analysis of ceramics (n = 162) from two settlements and one cemetery including cups, domestic vessels, urns, and wine-ware. Inter- and intrasite differences are noted and she provides traditional and alternative explanations of her results, concluding that institutional practices are related to the acquisition of skills. The level of skill investment in a vessel is linked to the role the vessel played in the social and ideological contexts of the living and the dead.

"Thinking outside of the pot: What other containers can tell us about the inception of ceramics in the Neolithic Near East" by Rachel Conroy, National Museum of Wales (pp. 19-29, 6 figures, 3 tables, 31 references) concerns the question of the origins of fired ceramics in the Near East. It provides introductory information on the aceramic Pre-Pottery Neolithic and subsequent Pottery Neolithic focus on the early 7th millennium BCE. She considers the appearance of ceramics in Japan and Greece (Franchthi Cave) in terms of chronology and vessel use before turning to how ceramic vessels shaped social interaction – 11 vessel raw materials are considered as alternatives (stone, basketry, hide, wood, plaster, etc.). Containers and consumption are reviewed and social interactions are related to consumption activities.

"The trajectory of the wheel-coiling technique in the southern Levant: historical scenarios and explanatory mechanisms" by Valentine Roux, CNRS, Nanterre, France (pp. 31-32) considers social parameters that lead to the appearance and disappearance of wheel-coiling in the Levant. The method is seen in the Chalcolithic and Early Bronze II and III period; *tournettes* were also used in III. Wheel-coiling disappeared during Early Bronze IV (the end of the 3rd millennium BCE). Learning networks and *châine opératoire* are also considered. Roux's full paper appears as "Evolutionary trajectories of technological traits and cultural transmission: A qualitative approach to the emergence and disappearance of the ceramic wheel-fashioning technique in the southern Levant" as Chapter 5 in *Breaking Down Boundaries: Anthropological Approaches to Cultural Transmission and Material Culture in Memory of Carole Kramer*, Miriam Stark, Brenda Bowser, and Lea Horn (editors), Tucson: University of Arizona Press, 2008 (pp. 82-104); reviewed in *SAS* [*Society for Archaeological Sciences*] *Bulletin* 32(3):23-24 (2009).

"Undecorated Calatagan pots as active symbols of cultural affiliation" by Grace Barretto-Tesoro, University of the Philippines (pp. 35-46, 10 figures, 2 tables, 100 references). The author views locally produced earthenware vessels from the central Philippines during the period from the12th to 16th centuries CE as not inferior to foreign ceramics, which were considered as high status items, but possessing ritual functions that signaled the cultural affiliation of the deceased. In this paper, based on her 2007 University of Cambridge dissertation, she focuses on Calatagan burial sites excavated south of Manila dating to the 15th century. Barretto-Tesoro presents her theoretical perspective, discusses mortuary rituals and cultural identity, and summarizes data on mortuary goods from 429 burials: 34.6% had local earthenware and 38.7.3% [sic., p. 37] had foreign ceramics. Burial attributes and locations are reviewed and she considers burial and pot orientations. Pots sometimes served as head substitutes, while infants were buried in jars. Some burials had no grave goods and she contends that burials without vessels are likely to have belonged to outsiders. In "Pottery and feasting in central Sweden" by Thomas Eriksson, Uppsala University (pp. 47- 55, 10 figures, 46 references), the author examines pottery from sites in the Mälaren Basin located in the eastern part of central Sweden during the Bronze Age and pre-Roman Iron Age, focusing particularly the transition between these two periods, ca. 500 BCE. Bronze Age ceramic assemblages and contexts are reviewed and contents related to feasting are characterized, notably drinking and eating using fine pottery. He postulates a loss of prestige technologies, including pottery, during the Early Iron Age, and relates depopulation and radical changes in social structure.

"A re-evaluation of the pottery assemblages from Ville-es-Nouaux, Les Platons and La Hougue Mauger, Jersey, Channel Islands" by Paul-David Francis Driscoll, University of Bristol (pp. 57-65, 10 figures, 35 references). The author discusses the

geography of the Channel Islands and focuses on the sites and pottery assemblages of Ville-es-Nouaux and compares these with the other two sites in Jersey. These date to the Bronze and Iron ages (2nd and early 1st millennium BCE). Jersey bowls, beakers, and barrel-shaped flowerpots are described and he describes how pottery was employed as a medium in defining identity and how these became modified through time. Intra-island communities may have contributed to the ceramic repertoire through the incorporation of pottery into localized burial monuments.

In "Thoughts and adjustments in the potter's backyard" by Olivier Gosselain, Université Libre de Bruxelles (pp. 67-79, 11 figures, 59 references), Gosselain continues to provide readers with case studies that reveal important details on modern pottery production in Sub-Saharan Africa, in this instance, southern Niger. He reviews his fieldwork in Niger (2000 ff.), the environment and economy, climatic problems (especially drought), long distance trade, craft specialization, and social contexts and then employs *châine opératoire* to review clay selection, processing, and shaping. Technical actions, recipes, and shaping processes are detailed. He demonstrates that the geographical space in which potters work and their social interactions are dependent upon the dynamics of pottery traditions in channeling the spatial diffusion of knowledge and influencing the symbolic meaning of technical practices.

"The hand that makes the pot…: Craft traditions in South Sweden in the third millennium BC" by Åsa M. Larsson, Uppsala University (pp. 81-91, 9 figures, 1 table, 74 references) provides evidence of pottery making during the Middle Neolithic (3rd millennium BCE) in South Sweden. The author discusses chronology and material culture, focusing on pottery style, decoration, uses, and contexts in Pitted-ware Culture (PWC) and Battle-axe Culture (BAC); the latter replaced Funnel Beaker ca. 3300 BCE, while Corded Ware appears ca. 2900 BCE. Larsson reviews craft production in traditional societies – "learning by doing" – and focuses on *châine opératoire* in examining choices of clay and temper. There are comparisons of clay, temper, shaping, surface treatments, decoration, and firing and he suggests that PWC and BAC were autonomous social groups and that hybrid forms appeared only at the very end of the period.

In "The vessel as a human body: Neolithic anthropomorphic vessels and their reflection in later periods" by Goce Naumov, University of Skopje (pp. 93-101, 11 figures, 64 references) the author examines data from the Balkans, noting that archaeologists characterize the pottery by using idioms familiar from human anatomy (mouth, neck, belly, leg, etc) suggesting that vessels have been conceptualized as human bodies regardless of whether or not their shapes actually resemble humans. Balkan specimens have painted incised, appliqué that represent corporeal elements (extremities, breasts, genitalia, etc.). Naumov discusses the typology of hand-built anthropomorphic vessels and the relationships between figurine-house models and anthropomorphic vessels and notes the feminine aspects of these vessels. Human burials are recovered from inside these containers and he examines ethnographic and etymological implications of his data.

The last two contributions are "contributions to the sciences" – C14 and OSL. "Influence from the 'Group Rhin-Suisse-France Orientale' on the pottery from the Late Bronze Age urnfields in western Belgium. A confrontation between pottery forming technology, 14C dates and typo-chronology" by Guy de Mulder, Ghent University; Walter Leclercq, Université Libre de Bruxelles; and Mark Strydonck, Royal Institute for Cultural Heritage, Brussels, Belgium (pp. 105-115, 11 figures, 3 tables, 41 references). Kimmig (1940) published a theory on Central European urnfields that remains in vogue and has influenced archaeological thinking. The authors discuss Group Rhin-Suisse-France Orientale (RSFO) pottery initially by reviewing Late Bronze Age chronology in Europe and then emphasizing this period as seen in western Belgium. The traditional chronology in Belgium has been based largely on typological seriation. Methods of clay preparation, temper, and building technique seen in western Belgian vessels are distinct from the vessels from the core area of Group RSFO. The typo-chronologies of urn types are reviewed and compared to nine radiocarbon dates. Preliminary results from two urnfield cemeteries do not conform to the chronological framework currently in use. In "Dating a pot beaker and the surrounding landscape using OSL dating" by Simone B. C. Bloo and Frieda S. Zuidhoff, both ArcheoSpecialisten Amersfoort, The Netherlands; and Jakob Wallinga, and Candice A. Johns, both Delft University of Technology, The Netherlands (pp. 117-123, pp., 6 figures, 25 references) the authors review the landscape and typology of Pot Beakers before discussing a unique Iron Age-Roman period Pot Beaker excavated from a clay layer in a river terrace of the Meuse. They also discuss Optical Stimulated Luminescence (OSL) dating methods, equivalent dose analysis, and dose rate analysis. The OSL age of the Pot Beaker is ca. 2900 +/- 400 BCE which is similar to the date of the surrounding sediments, 2700 +/- 450 BCE; the underlying dune deposit dated 6900 +/- 500 BCE.

These contributions focus, in the main, on western and Central European Bronze age ceramics but the contributions on the Near East by Roux (published elsewhere), the contribution by Barrretto-Tesoro on Calatagan, Philippines pottery, and Gosselain's captivating ethnographic chapter on Niger pottery, which has major implications for ethnoarchaeology, are worthy and significant presentations. *Châine opératoire* and inferences about learning the craft of pottery making are explicit in a number of the contributions. The Prehistoric Ceramics Research Group is to be congratulated for organizing and holding this conference and for publishing these important and stimulating papers.

Khmer Ceramics: Beauty and Meaning, Dawn F. Rooney with contributions by Krisda Pinsri and Pariwat Thammapreechakorn, photography by Robert McLeod, Bangkok, Thailand: River Books, 2010. 214 pp., 300 color illustrations, 195 line drawings. ISBN-10: 9749863887, ISBN-13 978 974 9863 88 6, $65.00 (hardcover). Dr. Dawn Rooney, an American who lives in Bangkok, is an art historian and

independent scholar who specializes in Southeast Asia. She has written nine books, including four on the ceramics of the region. Rooney is the author of a volume on the ceramic kilns at Sukhothai, *Ancient Sukhothai: Thailand's Cultural Heritage* (Bangkok, Thailand: River Books, 2007), *Bencharong: Royal Thai Porcelain* (Bangkok, Thailand: River Books, 2008), and co-author with H. Honda and N. Shimazu of *The Beauty of Fired Clay: Ceramics from Burma, Cambodia, Laos, and Thailand* (Singapore and Oxford: Oxford University Press, 1997) as well as numerous journal articles.

This lavish volume focuses on two aspects of Khmer ceramics -- their beauty and their meaning -- and examines these themes through a study of the "extraordinary" private collection of Yothin Tharahirunchot. The author explores the meaning of Khmer ceramics within the context of their function and calls attention to their aesthetics. The largest and most complete in the world, the collection of Yothin Tharahirunchot, comprises 160 pieces and "reflects the owner's knowledgeable eye, keen sensibility, and enduring passion for Khmer ceramics." Yothin Tharahirunchot invited "renowned ceramics expert Dawn F. Rooney" to research and publish the collection, and two Thai scholars, Krisda Pinsri and Pariwat Thammapreechakorn, were commissioned to research specific aspects of the subject. Pinsri is a curator of Southeast Asian ceramics at the Bangkok University Museum, while Thammapreechakorn is a Lecturer at Surindra Rajabht University and the former curator of archaeology at the Bangkok National Museum. The results of their detailed research on the collection are presented for the first time in this book. Yothin Tharahirunchot also invited Robert McLeod, an internationally-known and award-winning photographer, to document the collection with color images (mostly in a single-page format) supported by descriptive captions that include catalog numbers, pottery characteristics (earthenware, stoneware, etc.), provenance, chronological assignment, measurements (l., h., d.), and a brief descriptive narrative.

Rooney begins with series of brief contextual essays (pp. 8-13, 22 references, 5 endnotes): "Introduction" and "Khmer Ceramics: Beauty and Meaning" (pp. 8-9); "The Setting," including discussions of the four chronological periods spanning the period from ca. 1500 BCE to CE 1863, and a discourse on beliefs (animism, ancestor worship, Hinduism, and Buddhism) (pp. 9-11). In "Khmer Ceramics (pp. 11-13), she provides background information on ceramic research since the mid-1990s, recent archaeological ceramic research (surveys and kiln excavations), the excavation of ceramics at six temples and three excavations at the Royal Palace, and the "Living Angkor Road Project" -- a study of the 254 km Ancient Royal Road from Angkor to Phimai, Thailand in use during the Angkor Period (802-1432 CE). A useful "Map of Cambodia" (p. 32) shows site locations in Southeast Asia (Thailand, Cambodia, and southern Vietnam).

The section entitled "The Collection" (pp. 14-145) is primarily descriptive and organized chronologically. The Prehistoric Period (pp. 16-22), dated ca. 1500 BCE-ca. CE 100, features eight pieces; two unglazed earthenware figures, two pots, and one each of a *kendi* (spouted pot), cylindrical container, pedestal bowl, and bell. The Early Historic Period (pp. 23-31), 100-800 CE includes 10 earthenware specimens: fish and frog figures and eight vessels (six *kendi*, one cylindrical vessel, and one bottle). The subsequent Angkor Period (pp. 32-137) has a chronology of 802-1432 CE. There are green glaze pieces dated to the 10^{th}-11^{th} centuries (pp. 32-52); the specimens include two conches, a finial, four architectural tiles, two antefix, a broken figure base, three jars, five jars with covers, two bottles, and eight covered boxes. The 12^{th}-13^{th} centuries collection also has nine green glazed pieces (pp. 53-59) exemplified by two elephants, and one each of a pot, conch, mirror handle, human figure, bottle, jar, and jar with cover. The 12^{th}-13^{th} centuries green- and brown-glazed ceramics (pp. 60-77) include five bottles, a pedestal bowl with cover, a cover with a human face, one human figure, that head of a deity, a Ganesha, two rabbits and one each of a jar, pot, bird, cat, fish, and horse.

The Angkor Period (12^{th}-13^{th} centuries) is also represented by brown-glazed animals, among them two boars, one cat, a deer, five elephants, two frogs, two lions, a pangolin, two rabbits, and a snail. Brown-glazed specimens dated to the 12^{th}-13^{th} centuries (pp. 90-102) are abundant in the collection, including seven human figures as well as brown-glazed human figures on three bottles, a Meditating Buddha, one monkey soldier, a head of Shiva, a Ganesha, and one *kinnari* (a female demigod). The 12^{th}-13^{th} centuries' brown-glazed vessels (pp. 103-121) comprise 11 jars, two jars with covers, three bottles, three pots, two bowls, a bowl with cover, and a ewer. For the same period there are brown-glazed vessels with animal appendages (pp. 121-128) including seven pots, one bottle, and one *kendi*. The collections also includes seven objects from the Angkor period (pp. 129-134) include two conches, and one each of a toy or water dropper (?), a weight, lamp, *yoni* (Sanskrit for "womb"), and depiction of a Royal Pavilion. The Angkor period for the 12^{th}-13^{th} centuries (pp. 135-137) is also represented by one votive tablet, one *chakra* (solar disk), and four molds for votive tablets. The Post Angkor Period (pp. 138-145) has a chronology of 1433-1863; the specimens include one each of a buffalo, elephant, bull, monkey, turtle, two rabbits, and one each of a bowl, bottle, and jar. Ten references are listed on p. 144.

The first research essay, "Iconography of Khmer Ceramics" by Krisda Pinsri (pp. 146-165, 30 references in Thai and 18 in English, with 2 illustrations of stone objects [column and lintel]), provides information on Cambodian iconography, architectural decorations, and religious sculptures (Hindu, Buddhist, and "general"). Hindu ceramic objects discussed include Ganesha, and yoni, while the Buddhist objects discussed include votive tablets and Buddhist images, and *chakra*. "General" forms depict *yakshas* (demigods), monkey sculptures, vessels and utensils, Tantric ritual objects, conch shell utensils, mirrors, and temple models. Ritual objects (Tantric, Buddhist and Hindu, and "general") include fish, turtle, wild boar, and rabbit utensils; owl, deer, cat, elephant, swan, peacock, bull and cow, buffalo-shaped, lion, frog, rabbit, *kinnari*, and lotus-shaped vessels, and everyday ritual objects (water pots).

The second essay, "Development of Khmer Ceramics in the Angkorean Period" by Pariwat Thammapreechakorn (pp. 166-187, 8 references in Thai and 20 in English) focuses on the topics of the chronological development of Khmer pottery, prehistoric ceramics, Funan ceramics, Pre-Angkorean and Angkorean ceramics before the rise of Ankor Wat, Angkorean ceramics, and Phnom Kulen ceramics; vessel forms, pastes, glazes, and firing are also documented (pp.172-173). Buri Ram ceramic shapes [53 illustrated]), paste/fabric, glaze, and firing techniques are characterized (pp. 176-177); 17 color illustrations and 195 line drawings accompany the narrative. "The relationship between Chinese Song and Khmer Angkorean Ceramics" by Pariwat Thammapreechakorn (pp. 188-209, 118 color illustrations) provides background information about Cambodian glazed ceramic production, considers four major trading ports during the Song dynasty (map, p. 200), and characterizes 18 ceramic wares: Yue, Ningbo, Shangyu, Wenzhou, Meixian, Jingdezhen, Xicun, Bijiashan, Qishi, Longquan, Nanking (Nan'an), Ding (Quyang), Yaozhou, Guan, Jian, Cizao, and unidentified wares presumably from Quandong and Fujian. The "Chronological Table" (pp. 196-197) illustrates relationships and provides correlations on Cambodian kings, art styles, ceramic types, Chinese prototype ceramics, and Song emperors. The associated references include 13 in Thai and 21 in English (p. 209). Lastly, there are three appendices on p. 210: "Chronology of Cambodian Kings," "Chronology of Chinese Dynasties," and "Notes on Terminology and Spelling" (English, Chinese, and Thai), and the triple column "Index" (pp. 211-214) includes proper nouns and includes citations to the illustrations.

While primarily oriented to art historians and Southeast Asian specialists in ceramics and material culture, this volume has great value in having documented a significant collection of Khmer ceramics and providing contexts on recent ceramic studies and kiln excavations. The three essays by Thai scholars Krisda Pinsri and Pariwat Thammapreechakorn are significant, groundbreaking contributions to our understanding of the technical aspects of pottery making in the region from ca. 1500 BCE to 1863 and provides a foundation for future scholarship in ceramic analyses.

Anne Mayor, "**Ceramic traditions and ethnicity in the Niger Bend, West Africa**," *Ethnoarchaeology: Journal of Archaeological, Ethnographic, and Experimental Studies* 2(1): 5-47 (Spring 2010) [Rebecca Miller, translator]. The author reports on research conducted since 1988 in the Niger Bend,, especially in Inland Niger Delta and Dogan Country in Mali. The article data derives from three research approaches: ethnoarchaeological, ethnohistorical, and archaeological with two objectives in mind: "… to demonstrate that the study of systematic links established in the present between ceramic traditions and their meaning enriches the interpretation of the regional archaeological record and makes it possible to propose models for population history" (p. 6). She identifies 12 ethnic groups, 13 ceramic traditions, and 33 technological, morphological, and ornamental variables in the context of defining four major shaping techniques. The small size of the illustrations, especially the detailed maps, makes it difficult to read the texts within (even with a magnifying glass); the publisher should have allowed for larger illustrations. Portions of this article are derived from her 2005 dissertation *Traditions céramiques et histoire du peuplement dans la Boucle de Niger (Mali) au temps des empires précoloniaux*. Unpublished Ph.D dissertation. University of Geneva, Geneva, Switzerland. Mayor has also published "Durée de vie des céramiques africanes: Facteurs responsables et implications archéologiques," in *Terre cuite et société: La céramique, document technique, économiques, culturel*, Editions APDCA, Juan-les-Pins, pp. 179-198 (1994); and "Integrating ethnoarchaeological, historical and Archaeological data: Towards a history of pottery traditions in the Niger Bend," in *Online Proceedings of the 18th Biennial Meetting of the Society of Africanist Archaeologists*, University of Calgary, Calgary, Alberta, Canada (2006) http://cohesion.rice.edu/centersandinst/safa/news.cfm?doc_id=9495. Her research expands and supplements materials in Olivier Gosselain's 2001 chapter "Globalizing local pottery studies," in Beyries, S., and Petrequin, P. (eds.), *Ethnoarchaeology and its Transfers: Papers from a Session Held at the European Association of Archaeologists' Fifth Annual Meeting*, British Archaeological Reports, International Series S983, Archaeopress, Oxford, England, pp. 95-111; and in Alexandre Livingstone Smith's *Chaine opératoire de la poterie: Références ethnographiques, analyse et reconstitution*, Unpublished Ph.D. dissertation, Université libre de Bruxelles, Bruxelles, Belgium (2001). Mayor may be reached at: anne.mayor@anthro.unige.ch

Online Resources

Mesoamerican Pottery Database has been announced by FAMSI (Foundation for the Advancement of Mesoamerican Studies, Inc., Crystal River, Florida, USA) and is available online at http://research.famsi.org/rollouts/index.html . Dr. Inga Calvin has teamed up with FAMSI to create a fully-searchable pottery database which integrates photographic images with maps, plans and the excavation contexts of PreColumbian vessels from Guatemala, Mexico, and El Salvador. Most of this information comes from academic reports, journals and interim excavation notes. All of the ceramics are curated by museums in the United States, Guatemala, Mexico or El Salvador. Studying ancient pottery provides information about stylistic forms, decorative design motifs, iconographic elements and epigraphic information. When this information is combined with data from archaeological excavations, researchers can begin to understand the function of the pottery and the meaning to the people who created and used it. Additional materials will be added regularly and Dr. Calvin invites data from similarly provenienced excavations. The use of these photographs and data are limited to noncommercial, educational and personal use. All users must cite the author and source of the data with the URL www.famsi.org. The author does not warrant that the use of any of data will not infringe on the rights of third parties. Data presented in this may be held under copyright by others and the use of such data requires the prior permission from the copyright holder. First time users or anyone not familiar with FAMSI datasets, begin with the explanation of "How to Use the

Mesoamerican Pottery Database." As of October 2010, 21 sites were listed.

Postclassic Ceramic Database, sponsored by the US National Science Foundation. http://www2.sfasu.edu/soc/Cecil%20Web%20page/Web%20page/Web%20page/About.html The goal of this project is to investigate socioeconomic (and thereby sociopolitical) relations in the Late Postclassic (post A.D. 1200) Maya lowlands through stylistic and technical analyses of two widespread ceramic categories that were excavated from ritual contexts: red-slipped pottery (redwares) and incense burners (incensarios). In addition, ceramic molds used to form the effigy faces of incensarios, occasionally recovered in the excavations, also will be studied. There are four specific objectives: 1) Categorize the technological and stylistic choices (technological styles) that were compatible with and reinforced Postclassic Maya identities; 2) Identify the direction and extent to which Postclassic Maya from north-central Yucatán, Belize, and Guatemala were moving artifacts and/or their ideology across the landscape; 3) Address the advantages and disadvantages of the type-variety classification system when examining Postclassic Maya interactions across the landscape; and 4) Establish a publicly accessible ceramic database with stylistic, mineralogical, and trace chemical data that will advance the discussion of ceramic typology, manufacture, and distribution.

Analyses will focus on the technological and stylistic characteristics of two categories of pottery commonly used in rituals and excavated from ceremonial contexts: redwares and incensarios consisting of vase-like receptacles with attached human- or deity-figure effigies (as well as the effigy molds). These two categories of pottery were selected because they are found throughout the northern and southern Maya lowlands in the Late Postclassic and Colonial periods (A.D. 1200-1700) and because they are most commonly associated with Postclassic rituals (i.e. New Year ceremonies) and sociopolitical identity. In addition, they were chosen because subdivisions (such as pottery type) of the two artifact categories have general trends throughout the Maya lowlands, but also have regional paste, slip, and decorative paint differences (technological styles) that cannot be detected without archaeometric techniques. It is this unexplored variability that will allow for a better understanding of the complexity of the interactions between Postclassic Maya of north-central Yucatán, Belize, and Guatemala. There are ten components to the Internet site: Project Details: Sites, Collaborators, Bibliography, and Personnel & Contacts; Technical Discusion [sic.]: Samples and Analytical Techniques; and Database (by Site and Ceramic Type and by Chemical Group).

Codex-style ceramics: New data concerning patterns of production and distribution by Dorie Reents-Budet (Department of Anthropology National Museum of Natural History, Smithsonian Institution, Washington, DC, and Museum of Fine Arts Boston, Boston, MA, doriebudet@verizon.net), Sylviane Boucher Le Landais (Yoly Palomo Carrillo Centro INAH Yucatán), Ronald L. Bishop and M. James Blackman (Department of Anthropology National Museum of Natural History, Smithsonian Institution, Washington, DC). Paper presented at the XXIV Symposium of Archaeological Investigations in Guatemala (July 19-24, 2010), Museo Nacional de Arqueología e Etnología, Guatemala City, Guatemala. Abstract: Codex-style pottery has been the focus of art historical, epigraphic, and archaeological inquiry for more than three decades (Bishop 1984; Coe 1973, 1978; Cohodas 1989; Crocker 1977; Kerr and Kerr 1988;
Matheny et al. 1980; Forsyth 1989; Hansen and Gurr 1980; Nielson 1980; Reents-Budet and Bishop 1987; Robicsek and Hales 1981). The large number of vessels and their distinctive artistic variability indicate the importance of this pottery within the Late Classic Maya tradition of painted ceramics (A.D. 550-850). Yet its apparent restricted distribution among sites in the Mirador Basin of northern Guatemala is incongruous with its other features that suggest codex-style pottery played the typical roles of food service and gifting wares during socio-politically charged feasts (Reents-Budet 2000). Recent archaeological, art historical and epigraphic data provide a new perspective on codex-style pottery that offers supplementary information concerning its function and the nuances of social politics in the region during the 7-8th centuries in the Maya lowlands. The URL is http://www.mayavase.com/codex.pdf (20 pp., Adobe Acrobat required.)

Boletín del Laboratorio de Petrología y Conservación Cerámica Volumen 2, nº 2. Año 2 (julio 2010) ISSN Nº 1851-118X. Guillermo A. De La Fuente has announced the availability of the latest issue of this important publication; to receive a copy and to be added to the distribution list, email him at labceramicaunca@gmail.com . He writes: "Estimados colegas, adjuntamos en el presente email el nuevo número del *Boletín del Laboratorio de Petrología y Conservación Cerámica*. Cordiales saludos, Dr. Guillermo A. De La Fuente. Laboratorio de Petrología y Conservación Cerámica, Escuela de Arqueología, Universidad Nacional de Catamarca, CONICET, Belgrano N° 300, 4700- Catamarca, ARGENTINA. Tel./Fax: 00-54-3833-425978, email: labceramicaunca @gmail.com" This issue has four articles: "Vitroclastos en la Cerámica Viluco: Estudios Petrográficos en la Cerámica Viluco y Colonial del norte de Mendoza" por Cristina Prieto Olavaria, Brigida Castro de Machuca, y Lorena Puebla (pp. 1-8). "Procesos de Formación en Cerámica de Cazadores-Recolectores de la Provincia de La Pampa: Alcances y Limitaciones de una Experimentación" por Ivana Laura Ozan (pp. 9-17). "Pastas Desgrasadas con Calcita y Pastas Desgrasadas con Materia Vegetal: Una Aproximación Experimental" por Daniel Albero Santacreu (pp.18-34). "Incidencia de la Restauración en la Decoración de la Cerámica de Numancia (Soria, España)" por Verónica Estaca-Gómez y Aixa Vidal (pp. 35-45).

The University of Texas San Antonio's Center for Archaeological Research, http://car.utsa.edu/ , announced that all of their publications are now available online. The UTSA Libraries Special Collections recently began a collaborative project with UTSA's Center for Archaeological Research (CAR) to provide electronic access to all of the Center's back publications. CAR is a State Certified Curatorial Repository and the CAR digital collection encompasses all of the Center's publications between 1974 and 2009,

http://digital.utsa.edu/cdm4/browse.php?CISOROOT=/p15125coll8 . These include the Archaeological Survey Reports Series (#1-402), Choke Canyon Series (#1-11), Guidebooks in Archaeology (#1-3), Regional Studies (#1-3), San Juan Batista Studies Series (#1-3), and Survey Reports (#1-14). A majority of the documents are archaeological survey reports from excavations performed by CAR in southern and western Texas, including several significant archaeological excavations in the San Antonio area. These 436 reports in the collection total over 30,000 digitized pages and are full text searchable. Additional publications are being added regularly, but all were available by the end of August 2010. Marybeth S. F. Tomka (Laboratory Director and Curator, Center for Archaeological Research, University of Texas at San Antonio) advises that publications are no longer available directly from CAR. There are 324 entries when searching for "ceramics" and 258 in searching for "pottery." Searches yielded only one title concerned with ceramic materials: *A Guide to Ceramics from Spanish Colonial Sites in Texas* by Anne A. Fox and Kristi M. Ulrich, with contributions by Barbara A. Meissner, Center for Archaeological Research The University of Texas at San Antonio, Special Report 33, 2008, http://digital.utsa.edu/cdm4/document.php?CISOROOT=/p15125coll8&CISOPTR=42509&REC=7. This volume was reviewed in *SAS Bulletin* 32(4):21-22 (2009). A majority of the urban archaeology and Spanish Colonial Period archaeology in the state, and are a resource for historic archaeologists and scholars interested in culture change, ethnogenesis, and the archaeology of industrialization. A few selected pages from reports, pages showing site locations, have been redacted to protect the sites from vandalism. These pages may be obtained from the Center through special requests addressed to the Center Director, Steve Tomka: Director, Center for Archaeological Research, The University of Texas at San Antonio, One UTSA Circle, San Antonio, Texas 78249-0658, USA.

Previous Meeting

Arthur Pope and A New Survey of Persian Art: An International Symposium was held 10-11 September 2010, at the Art Institute of Chicago, Chicago, IL, USA. The symposium related directly to an exhibition "Arthur Pope and A New Survey of Persian Art" from 17 July -3 October 2010 in Regenstein Hall. The event was free with museum admission and open to the public. Pope had a particular interest in Blue-and-White ceramics. The symposium included the following presentations: Robert Hillenbrand (University of Edinburgh) "The Scramble for Persian Art: Pope and His Rivals" (part of the Asian Art Council Lecture Series); James Cuno (President and Director of the Art Institute of Chicago) and Harvey B. Plotnick (Trustee of the Art Institute of Chicago and Collector of Medieval Islamic Ceramics) "Arthur Upham Pope: Life and Achievements"; Jonathan M. Bloom (Boston College) "Arthur Upham Pope: His Life and Times"; Donald Whitcomb (Oriental Institute, University of Chicago) "Archaeology in Iran and the Experience of Arthur Upham Pope"; Bernard O'Kane (American University in Cairo) "Arthur Upham Pope and the Study of Persian Islamic Architecture"; Lindsay Allen (Kings College, University of London) "Arthur Upham Pope and Placing Persepolis in 'Persian' Art: His Creation of 'Persian Art' as a Collectable Genre"; Yuka Kadoi (Art Institute of Chicago) "Toward a Foundation of Persian Islamic Art Connoisseurship: Arthur Upham Pope and Early 20th-century Chicago"; and Sheila S. Blair (Boston College) "Surveying Persian Art after Pope's Survey." A discussion and exhibition viewing followed.

The 2010 American Ceramic Circle (ACC) Symposium hosted by the Chipstone Foundation and the Milwaukee Art Museum (MAW) included a series of lectures and related activities 4-7 November 2010 at the Santiago Calatrava designed MAW situated on the shore of Lake Michigan. The 2010 Symposium coincides with the exhibition "Art in Clay: Masterworks of North Carolina Earthenware" sponsored by Old Salem Museum and Gardens, the Chipstone Foundation, and the Caxambas Foundation. The exhibition showcased more than 120 objects from the major North Carolina earthenware traditions and these were discussed by the exhibit's co-curator, Luke Beckerdite at an evening lecture and reception. The Symposium's lectures, presented by an internationally recognized group of scholars, covered topics relating to 16th to 19th century American, Chinese, English, and European ceramics. Major speakers included Bly Straube, Jed Levin, Victor Owen, Rob Hunter, Ellen Denker, Jody Clowes, Michelle Erickson, Mel Buchanan, Dawn Odell, Nonnie Frelinghuysen and Kate Smith. Reino Liefkes, Senior Curator of the V&A reviewed the re-installation of the new ceramics galleries. Ivor Noel Hume was in attendance to discuss his collection during a special tour of the Chipstone Foundation. Attendance to ACC Symposium is normally limited to ACC members but a number of guest registrations were available. Visit the ACC website for further details: http://www.amercercir.org/

Forthcoming Meetings

Ceramic Ecology XXIV: Current Research on Ceramics 2010, scheduled at the American Anthropological Association Annual Meeting, 18 November 2010, 1:45-5:30 pm, in New Orleans, Louisiana. Symposium Organizer and Chair: Charles C. Kolb (National Endowment for the Humanities). Symposium abstract: The papers in this international and interdisciplinary symposium, the 24th in the annual series, reflect a number of approaches within the framework of Matson's concept of Ceramic Ecology, set forth in his volume, *Ceramics and Man* (1965). In this work Matson -- a ceramic engineer, archeometrician, ceramic ethnoarchaeologist, and ethnographer -- stated that "unless ceramic studies lead to a better understanding of the cultural context in which ceramic materials were made and used, they form a sterile record of limited worth." Ceramic Ecology as a methodological and theoretical approach has as its paramount goal a better understanding of the peoples who made and used pottery and seeks to redefine our comprehension about the significance of these materials in human societies. The concept of Ceramic Ecology is contextual, multi- and interdisciplinary, and analytical. On the one hand, it seeks to evaluate data derived from the application of physiochemical methods and techniques borrowed from the physical sciences within an ecological and sociocultural frame of reference. It relates environmental

parameters, raw materials, technological choices and abilities, and sociocultural variables to the manufacture, distribution, and use of pottery and other ceramic artifacts. On the other hand, interpretation of these data and explanations of the ceramic materials utilize methods and paradigms derived from the social sciences, humanities, and the arts. The concept of Ceramic Ecology forms an implicit or explicit basis of the investigations reported by archaeologists, ethnographers, and others in this symposium in which emphasis is placed upon the technological and socioeconomic aspects of ceramic materials regardless of chronology or geography. It also demonstrates the value of the cross fertilization which results when investigators ranging from art historians and professional potters to ethnoarchaeologists and archaeometricians come together in a forum devoted to a topical consideration: ceramics. These papers continue a symposium series initiated at the 1986 AAA meeting by students of ceramic materials who are members of the informal "Ceramic Studies Interest Group," an organization formed at the suggestion of Matson. The abstracts of the papers are in the order or presentation; the Discussant is Michael Galaty (Millsaps College).

“Introduction to Ceramic Ecology XXIII: Current Research on Ceramics 2010” by Charles C. Kolb (National Endowment for the Humanities). “Full-Time Specialists Who Are Part-time Potters” by Dean E. Arnold (Wheaton College, Illinois). Using a base of more than forty years of the evolution of pottery production and distribution in Ticul, Yucatan, this paper elucidates those cultural ecological factors responsible for the changes from part-time ceramic specialization to full-time specialization. Originally, potters were subsistence agriculturalists tending their crop for part of the year and then making pottery for the remainder. Once part-time agriculture ceased, potters turned to intensifying their pottery production, but a variety of factors limited their ability to make pottery full-time such as household and family responsibilities for women, cyclical weather patterns, the availability of covered space, and more importantly the demand for pottery that varies in annual and multi-year cycles. Part-time and full-time specializations are not fixed categories for potters, but are very context dependent in ways that may have little to do with the homogeneity of the pottery itself.

“Epiclassic and Early Postclassic Interaction in Central Mexico as Evidenced Through Decorated Pottery’ by Destiny Crider (Arizona State University). The collapse of the Teotihuacan state devastated existing social, political and economic networks and prompted regional reorganization. The temporal focus of this study includes the initial regional fragmentation and development of competing city-states in the Epiclassic (ca. A.D. 650-850), through the emergence and establishment of the Early Postclassic (ca. A.D. 850-1150) Tula and Cholula states. Using pottery data from adjacent areas extending from Tula, Hidalgo through the eastern and southern Basin of Mexico, I implement an approach consistent with the goals of Ceramic Ecology by collecting diachronic evidence for interaction, reflecting changing local and regional response strategies. I assess attribute data of style, decoration and technical fabrication, as well as materials analysis (INAA) to evaluate the following outcomes for each area: 1) local isolation from regional networks, 2) participation in particular pottery complexes, 3) evidence for direct exchange or local production of regional pottery types, and 4) degree of shared technological and stylistic traits as evidence of emulation or shared learning communities for production. This study provides a robust multi-scalar study of local and regional interactions in this key transitional period. Variable pathways towards regeneration are assessed and include individual community decisions to: maintain an inward focused policy of isolationist behavior, seek new socio-economic partners and/or promote certain relations to the exclusion of others, and the expansion and conquest by an ambitious faction or state. By investigating diachronic slices of time, the diversity of local responses across the region indicates a complex set of shifting interactions during regional reorganization.

“Chemical Analysis of Pottery and Figurines from Tres Zapotes: Implications for Resource Exploitation and Exchange in the Formative and Classic Periods” by Christopher A. Pool (University of Kentucky), Erin L. Sears (University of Kentucky), Ronald L. Bishop (National Museum of Natural History, Smithsonian Institution), and M. James Blackman (National Museum of Natural History, Smithsonian Institution). Previous studies have documented variation in chemical composition for Classic period pottery produced in different resource zones in the Tuxtlas Mountains of southern Veracruz, Mexico. By comparison, recent, highly publicized studies of Formative period ceramic exchange in Mesoamerica have given little attention to intraregional variability in chemical composition within the southern Gulf lowlands. In this paper we present the results of instrumental neutron activation analysis of over 200 ceramic vessel and figurine specimens from Formative and Classic period contexts at Tres Zapotes. The results highlight patterned geographical variation in ceramic compositions and local production of pottery, including vessels decorated with Early Formative carved-incised motifs, while also suggesting mutual Formative period exchange between Tres Zapotes and the Coatzacoalcos and Tonalá basins and Classic period acquisition of fine-paste pottery from the central Tuxtlas. We employ an analytical framework grounded in holistic ceramic ecology to discuss the implications of these results for interpreting changing patterns of resource exploitation and exchange within and beyond the southern Gulf lowlands.

“Interaction and Ceramic Innovation in the Late Postclassic Tuxtla Mountains of Veracruz, Mexico” by Marcie Venter (University of Kentucky). Innovation in cooking technology characterizes ceramic assemblages of the Late Postclassic Tuxtla Mountains of Mexico. The use of tortilla griddles (comals) by lowland groups is generally considered the result of interactions with or migrations by highland populations, some of which may have settled in the region during episodes of Aztec expansion, disease, or famine. Despite their late adoption, griddles enjoyed a surprisingly wide distribution in the western Tuxtlas and are one of the key markers of the period. Here, I assess ceramic attributes from Totogal that characterize technological choices associated with the acquiring and processing of raw materials and the fashioning and firing of vessels. It has been suggested that particular aspects of ceramic

acquisition and manufacture processes can relate to different facets of identity. I address the question of migration in this paper and discuss whether highland-originating populations, if living alongside native groups at Totogal, can be discerned by way of the embedded ceramic learning networks represented within the new comal assemblage, and to what extent a ceramic ecological approach to innovation can inform processes of interaction within the Mesoamerican Gulf Lowlands.

"The Production of Volcanic Ash Tempered Pottery by the Late Classic Maya: A Question of Source" by Anabel Ford (ISBER/MesoAmerican Research Center University of California at Santa Barbara). The Late Classic period was the height of the Maya touted for their expansive civic architecture, high settlement densities, and convoluted political machinations recorded on stone stelae at the centers. They also had a most impressive ceramic assemblage that include a standard variety utility and fine wares making up serving, storage, and cooking vessels. Interestingly, while all early periods of the Maya pottery temper was made of local limestone material, the Late Classic pottery was made of two distinct types of temper: limestone and volcanic ash. The question is why did the Late Classic Pottery producers require volcanic ash at this time only? This paper explores the consequences of the possible answers considering imports and local availability.

"Clay Griddles and Basket Making: gendered technologies of the house at Cuentepec, Mexico" by Sandra L. López Varela (Universidad Autónoma del Estado de Morelos). The Cuentepec kitchen materializes the symbolic practices of mourning, divination, and pacifying hunger with the aid of San Miguel Arcángel in the making of clay griddles and basket making. At the house, the chiquihuitero works within well-defined cultural boundaries from those of the comalera. For generations, the house embodied the knowledge of both technologies with their marriage, reproducing the meanings of the griddles and the baskets in every ritual. Poverty has forced the chiquihuitero to abandon his craft. In the midst of resistance, the testimony of one of the last basket makers at Cuentepec illustrates the adaptation and innovation of the technological choices he has to make to maintain the identity of the chiquihuite within the spaces of modernity.

"The Raw Materials of California Plainwares: Investigating Communities of Practice through Ceramic Vessels" by Sarah Peelo (University of California, Davis). This paper analyzes the raw materials used to manufacture ceramics from four Spanish Missions in Alta California using petrographic analysis, electron microprobe analysis, and ImageJ software. The results suggest that each of these Spanish California Missions produced their own pottery using distinct local clays. However, analysis of inclusion shape and size, silt fraction, and sorting suggest that clay processing within each mission was rather variable. These results are important to understanding how diverse indigenous peoples living in colonial settlements created community. During the Mission Period (1769-1834) many California Indians left their local tribelets, around which they formed social identities, and relocated to mission settlements. Ethnohistoric studies demonstrate that California mission communities were places composed of people of many different tribelet, or ethnic, groups. The archaeological investigation presented here contributes to an understanding of how people from diverse local groups produced and reproduced their social and cultural identities once they moved to the pluralistic mission communities. Here I concentrate on the identities created through ceramic production, among those who manufactured pots. Indigenous potters participating in the day-today, stylistic and symbolic practices of different social communities create material patterning. By being active participants in social communities, people construct identities in relationship to them. When faced with living in places of cultural diversity, some mission communities may have formed a shared cultural identity through shared ceramic raw material choice, however, variations in clay processing within missions suggest multiple communities of practice and thus multiple identities may have formed out of this cultural interaction.

"Technological Traditions and Ethnic Co-Residence: A Comparative Study of Ethnoarchaeological and Archaeological Corrugated Cooking Pots" by Brenda Bowser (California State University, Fullerton) and Andrew Duff (Washington State University, Pullman). A common premise of archaeological pottery studies is that technological style is learned during early enculturation, likely to remain static throughout the lifetime of a potter, and maintained when potters migrate to new places, allowing archaeologists to reconstruct migrations and detect the formation of multi-ethnic settlements. We report ethnoarchaeological data from multi-ethnic villages in the Ecuadorian Amazon where adults re-learn pottery-making techniques, especially when they move to new communities, and we analyze technological attributes of corrugated pots to examine historical trajectories. These data are then compared to an archaeological case of proposed multi-ethnic settlement in west-central New Mexico.

"From Elemental Chemistry to Global Exchange: Inferring Social Economies and Interactions in Belgium, New Guinea, and the Indian Ocean-South China Sea" by Mark Golitko (University of Illinois at Chicago); Rahul Oka, Chapurukha Kusimba, John Edward Terrell, and Patrick Ryan Williams (all Field Museum of Natural History). Identification of the circulation of ceramics provides a valuable line of evidence for archaeological inference, not only of purely economic transactions, but also social connections along which less materially tangible aspects of culture may have been transmitted in the past. We explore the movement of ceramics at three geographical scales using chemical analysis by Laser Ablation-Inductively Coupled Plasma-Mass Spectrometry (LA-ICP-MS). On a micro-regional scale, we analyze the temporal distribution of different paste types at sites of the early Neolithic Linienbandkeramik (LBK) culture in the Hesbaye region of Belgium as a means of exploring inter-village alliance structures, ca. 5650-4900 BCE. On a regional scale, we examine the production and transport of ceramics along the Sepik Coast of northern New Guinea during the last two millennia as a proxy measure of human interactive and exchange networks, and how these networks relate to the high degree of cultural and linguistic diversity that currently characterize the region. On a global scale, we investigate how agglomerated yet decentralized production of Blue-and-White

porcelains in the vast Jingdezhen kilns in China managed to dominate markets in India and East Africa despite competition from other smaller kilns in China and state-sponsored kiln-workshops in Southeast and Southwest Asia and North Africa. We argue that with the combination of archaeological, ethnographic, and historical data, targeted chemical analysis can help archaeologists move beyond establishing provenience and distribution networks to analysis of past interactional behaviors, regardless of period, area, or scale of activity.

"Potters, Pots, and Identity: Community Variation in the Gamo Highlands of Southern Ethiopia" by John W. Arthur (University of South Florida, St. Petersburg). Previous research has shown that there are many factors, such as, vessel type, size, and function, producer skill, consumer preference, and market systems, which can affect vessel variation and standardization. This paper draws from my ethnoarchaeological research with the Gamo between 1996 and 1998 and addresses variation of ceramic vessels produced in different communities by full-time craft specialists. The Omotic-speaking Gamo, with a population of some 800,000 people strong, live in the highlands above Lake Abaya on the western edge of the Rift Valley, Ethiopia. They primarily are subsistence agriculturists, merchants, and craft specialists. This analysis consists of 1,058 vessels analyzed from 20 households from each of the three communities located in the central Gamo highlands. This paper focuses on three issues: (1) compares morphological features of specific vessel types to demonstrate if pots reflect specific potter communities, thus giving us a better perspective related to community identity; (2) evaluates a community reliant on the market system from two communities where a majority of pots are produced by resident potters; and (3) vessel size classes from the three communities will be compared to test if they are related to function. The dynamics of the Gamo production, distribution and use of pottery may aid in the archaeological interpretations of social interaction.

"Prehistoric Calabrian Potters in their Landscape: Current Results from the Analysis of Geological Clays and Archaeological Ceramics from SW Calabria, Italy" by Kostalena Michelaki (McMaster University). Since 2004, in three seasons (2004, 2006 and 2008) and as part of the Bova Marina Archaeological Project in SW Calabria, Italy, we have walked the landscape belonging to the communi of Bova Marina and Bova looking for clays and sediments that Neolithic and Bronze age potters might have been able to use in the production of their pots. Following a long tradition of ceramic ecology research, In this paper I will present the results of the laboratory analyses (INAA, thin section analysis, XRD and firing tests of briquettes) of geological clays and compare them to basic ceramic wares from the Neolithic and Bronze Age in the region in an attempt to examine the taskscapes those communities might have explored and how they would have changed through time. Preliminary data suggest that although production was small and local both during the Neolithic and the Bronze Ages, potters were not indiscriminate in their selection of clays. Furthermore, they switched their sources during the Late Bronze Age, although they did keep using local resources. This switch in raw materials was accompanied by changes in the ways pots were formed and finished, yet not by any striking change in the visual characteristics of the local pots.

"Minoan Potters and Cooks: An Experimental Approach to Understanding the Possibilities and the Probabilities of Ancient Pot Making and Use" by Jerolyn E. Morrison (University of Leicester, UK). The variety of cook-pots found in the archaeological record supports the argument that there is more to cook-pots than just their measureable properties. To better understand why these differences exist from a "functional daily-life point of view", I have designed a ceramic replication program that determines probable pathways ancient potters and cooks might have taken to produce and use their cook-pots. This experimental approach, rooted in Ceramic Ecology, is applied to the Late Minoan Mochlos material, a multiphase East Cretan site in the Bay of Mirabello. Presented in this paper are the two distinct phases of the project, pottery production and cooking. First, I will present the variable ways the Minoan potters could have dug, cleaned and processed the raw materials to create a workable clay body for pottery production to produce cook-pots. Once the vessels are produced, additional experimental exercises will be presented to demonstrate how the ancient cooks could have prepared and used their vessels over the hearth flame to prepare meals.

"Looking for Polities: Iron Age Ceramics in Central Anatolia" by Lisa Kealhofer (Santa Clara University) and Peter Grave (University of New England, NSW, Australia). The Anatolian Iron Age project has collaborated with seventeen sites across western Anatolia since 2004. This collaboration has involved sampling each site's ceramic corpus for both local and nonlocal ceramics, as well as sampling the geological variability within each site's catchment. The goal of the AIA is to use ceramic exchange – both of pots and of ideas – as a proxy for investigating aspects of political change and development in the wake of the collapse of the Hittite Empire in the 12th c. BC. Our approach, using archaeometric (NAA) data to explore changing societal parameters is central to 'ceramic ecology.' In this paper, we discuss our methodology and preliminary results of NAA of ceramics from five sites in central Anatolia. The diversity of styles and exchange partners, along with the relationship between emulation and the movement of pots, reveal features of Iron Age political economies in the region.

"Ceramics and Society in 17th Century Native New England" by Elizabeth S. Chilton (University of Massachusetts, Amherst), Julie Woods (University of Massachusetts, Amherst), and Matt Boulanger (University of Missouri Research Reactor). Algonquian communities in New England experienced a great deal of upheaval and change during the 16th and 17th centuries as a result of European colonization and the consequent changes in economic, social, and environmental contexts. In this paper we use ceramic attributes to examine some of the continuities in Native society, as well as some of the changes. In particular, we compare ceramic attributes from a pre-Contact Late Woodland period site from Deerfield, MA, to an assemblage from a 17th century Native settlement, also in Deerfield. Through an examination of ceramic recipes and available raw materials our study focuses on evaluating manufacturing processes, technical choices, and the roles of

localized production and regional interaction. We compare results from macroscopic vessel lot analysis, ceramic petrography, and neutron activation analysis to document the impacts of social and cultural change over a few generations. Through this analysis, we offer insights into ceramic ecology, population movements, cultural change and continuity, and the significant impact of European colonization in early 17th century Native New England.

2010 Classical Colloquium on Ceramics, Cuisine and Culture: the Archaeology and Science of Kitchen Pottery in the Ancient Mediterranean World has been announced by the British Museum's Department of Greece and Rome. This colloquium is organized jointly with the British Museum's Department of Conservation and Scientific Research and the "Tracing Networks" Research Programme (Universities of Leicester, Exeter and Glasgow), funded by the Leverhulme Trust, and to be held at the British Museum in London 16-17 December 2010. This conference is dedicated to the cross-disciplinary interpretation of ancient "kitchen pottery," i.e. utilitarian wares used as food containers or for food processing in a broad sense. By bringing together established scholars and young researchers from a wide range of academic backgrounds, including archaeologists, material scientists, historians, and ethnoarchaeologists, *Ceramics, Cuisine and Culture* will stimulate an international and interdisciplinary exchange of ideas and approaches. Themes will include: science, archaeology and society – how scientific techniques can reveal technological choices, cultural preferences and knowledge transfer production, consumption and the social biographies of utilitarian pottery – debates on the interplay of social and technological factors, social networks of production and consumption, development of specialist technologies (e.g. resistance to thermal shock), lifespan, re-use and recycling of kitchen pottery cuisine, culture and social hierarchies – the impact of context and status on food processing and storage, the significance of ritual, feasting, funerary and other 'special' contexts changing habits: cuisine on the move – innovations and adaptations in food processing and cooking in new or changing cultural settings, food and cultural identity, the impact of trade and migration. The conference aims to set this ubiquitous category of artefacts in its wider social, political and economic contexts, in order to exploit it more effectively for understanding ancient societies. The proceedings would be published in a peer-reviewed volume. Abstracts for 20 minute papers and posters are invited for submission by 30 May 2010. The organizing committee members are Alexandra Villing (BM), Michela Spataro (BM), and Lin Foxhall (Leicester). For further information and submission of abstracts, please view the Internet site at http://www.tracingnetworks.ac.uk/kitchen_pottery and contact the organizing committee at kitchenpottery@googlemail.com

Exhibitions

Chinamania: Whistler and the Victorian Craze for Blue-and-White is a year-long exhibition at the Freer Gallery of Art, Smithsonian Institution, Washington, DC, USA that opened on 7 August 2010 and closes on 7 August 2011. Blue-and-White Chinese porcelain became a hot item in London in the 1870s, a craze the British press mockingly dubbed "Chinamania." American-born, British-based artist James McNeill Whistler (July 10, 1834-July 17, 1903), an early collector of Chinese porcelain, helped stimulate this fad by depicting such wares in his paintings. The Chinamania exhibition at the Freer explores Chinese porcelain in Whistler's England, where it was first valued as aesthetic inspiration but soon proliferated as a commodity. Featured are twenty-three works of art: blue-and-white porcelain objects from the Peacock Room; eight wash drawings of Kangxi porcelain that Whistler produced for a collector's catalogue; and paintings, pastels, and etchings inspired by the artist's interest in porcelain. Additional information is available on the Smithsonian's Web site at http://www.asia.si.edu/exhibitions/current/chinamania.htm

Monochrome Ceramics from Ancient Mexico. This exhibit at the Fowler Museum, University of California at Los Angeles, runs from September 12, 2010 through January 23, 2011, and is curated by Kim Richter, the Fowler Museum's assistant curator of arts of the Americas, and is on view in the Fowler in Focus gallery, the central space within the long-term exhibition Intersections: World Arts, Local Lives. The objects demonstrate the rich ceramic history of ancient Mexico and stand in stark contrast to brilliantly painted Mesoamerican ceramics. The makers of these objects seem to have deliberately rejected color in favor of an aesthetic valuing the sculpted form. Since many of the works were contemporaneous with polychrome ceramic styles, they are understood to reflect a conscious artistic choice to stand apart from the colorful arts of Mesoamerica. Ranging from the Preclassic to the Postclassic periods, these styles reveal intercultural connections, such as between Teotihuacan, the great Classic urban center in Central Mexico, and the Maya region. This display of thirty-five monochrome ceramics includes elegant jars shaped as calabashes, vessels sculpted to represent various animals, and bowls carved with figural scenes or fantastic creatures, and highlight how ceramic styles were shared, appropriated, and transformed at specific historical moments in ancient Mexico. The ceramics on display are grouped by region, with works from Colima in West Mexico, Teotihuacan in Central Mexico, and the Maya in Southern Mexico, along with two cases of effigy jars used by different cultures in ceremonies. This exhibition commemorates the bicentennial of the Mexican War of Independence and centennial of the Mexican Revolution by showcasing the pre-Columbian heritage of Mexico. The diverse indigenous cultures of Mesoamerica fundamentally shaped what became the Mexican nation and continue to enrich Mexico's culture today. For more information, please visit the Internet site at http://www.fowler.ucla.edu/exhibitions/fowler-in-focus-ancient-mexican-ceramics

ARCHAEOLOGICAL CHEMISTRY

Ruth Ann Armitage, Associate Editor

As the latest editor for Archaeological Chemistry, let me say that my perspective will be primarily from that of a chemist, since that's what I am. My interest is in methodologies and

development of new analytical techniques for solving problems and answering questions of archaeological interest. Because of that, I'll be including some news about recent developments in conservation and museum science. The questions there may be different, and the materials of a different nature, but these developments may hold great promise for new and innovative approaches to using chemistry in archaeology. If you have archaeological chemistry news, please feel free to contact me and I'll do my best to include it in future SAS Bulletin reports.

Funding

The National Science Foundation announced a new program called SCIART in early 2010. This program, Chemistry and Materials Research at the Interface between Science and Art, is intended to bring together academic scientists and museums to develop approaches to some of the big problems in analysis of cultural heritage materials. While not specifically archaeological in scope, this is an opportunity for collaboration between the people with the instruments and the people with the artifacts! While the 2011 solicitation has not yet been posted by NSF, the lead program officer, Zeev Rosensweig, has assured me that there will be another call for proposals, due in May 2011.

Meetings

The **Second Science and Archaeology Symposium** will be held in Urbana, Illinois on November 12, 2010. The Program on Ancient Technologies and Archaeological Materials (ATAM), a division of the Illinois State Archaeological Survey in the Institute of Natural Resource Sustainability, will host a regional, one-day conference on archaeological science at the Levis Faculty Center on the University of Illinois.

FACSS, the Federated Analytical Chemistry and Spectroscopy Societies, has for the past several years been supporting a session titled, "**Chemistry in Art and Archaeology**." Watch for future sessions at http://www.facss.org. The 2010 session, held in Raleigh, NC, included five invited oral presentations:

- "Archaeometry: Combining Analytical Technique with Archaeological Interpretation to Find a Meaningful Relationship," a review paper by Michael Glascock on the contributions of analytical chemistry to archaeology.
- "XRF Analysis of Elementally Non Uniform Materials," a discussion by Bruce Kaiser of how portable XRF is best used with a fundamental understanding of the physics involved.
- "Spectroscopic Investigations of Archaeological Samples from the Coriglia, Castel Viscardo Excavation Site, Italy," a description by Mary Kate Donais about using portable instruments and chemometrics for in-situ analysis.
- "Handheld XRF analysis of the 6000 year old Nahal Mishmar Hoard of copper alloyed artifacts," a report from Aaron Shugar on the issues encountered in characterizing an entire collection of complex alloy materials.
- "LA-ICP-MS microsampling of human bones: The dynamic interaction between sample, introduction method and target data for organic minerals," a presentation by Ian Scharlotta about developing an effective analytical methodology for reliably extracting useful data from diagenetically altered bone.

The Eastern Analytical Symposium (www.eas.org) always includes several sessions on conservation science. Some of the sessions include topics or papers that might be of interest to archaeological scientists. This year, EAS is being held November 15-18 at the Garden State Exhibit Center in Somerset, New Jersey. The session entitled "**Synchrotron Radiation for Cultural Heritage**" in particular includes several talks on archaeometric subjects:

- Beyond the Surface: Analysis of Cracked Archaeological Glass, Hannelore Roemich, NYU Institute of Fine Arts Conservation Center
- Rust, Nails, Armors and X-Rays: Examples of Studies about Corrosion and Provenance of Archaeological Iron Objects, Philippe Dillmann, LAPA/SIS2M
- Glass, Inks, Pigments and Synchrotron Radiation, Koen Janssens, University of Antwerp
- Light and Sound: Non-Destructive Structural Analysis of Historical Musical Instruments with Synchrotron Radiation, Franco Zanini, Sincrotrone Trieste
- Recent Results and Perspectives for Synchrotron Studies on Cultural Heritage: Development of the IPANEMA Research Platform at SOLEIL, Loïc Bertrand, IPANEMA
- Hidden Images, Buried Interfaces, Vanishing Masterpieces: Recent Confocal X-Ray Fluorescence and XANES Experiments on Paintings at CHESS, Jennifer Mass, Winterthur Museum
- Breaking and Burning Pots: XANES and EXAFS Evidence for the use of Attic White Ground Lekythoi in Cremation Burials, Marc Walton, The Getty Conservation Institute
- Optical and SR studies of Archaeomimetic Hybrid Pigments, Eric Dooryhee, Brookhaven National Laboratory
- Rapid-Scan X-Ray Fluorescence Imaging of Ancient Documents - The Archimedes Project and Beyond, Uwe Bergmann, Stanford University
- Fit for the Ring: SR-XRD, Phase Contrast Imaging and EXAFS Studies of Chinese Bronzes and Altered Pigments, Francesca Casadio, The Art Institute of Chicago

The Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, better known as PITTCON, generally has open poster and oral sessions for **Analytical Instrumentation Applied to Art and Archaeology**. In addition, the organizers are always open to organized sessions on archeometric topics. Watch http://www.pittcon.org for the call for sessions, which are usually due at the beginning of April for the meeting in the following March. This year's poster session includes three student presentations:

- An Analytical Approach to the Detection and Quantification of Caffeine and Theobromine in Native American Pottery, Erin Capley
- Pigments in Dunhuang Wall Paintings, Weiqing Xu
- Development of GC-MS and DART-MS Methods for the Qualitative and Quantitative Analysis of Carbohydrates in Rock Paintings, Badrinath Dhakal

The American Chemical Society has long supported archaeological chemistry. There's even a subdivision for the subject, within the Division of the History of Chemistry. Dr. Jim Burton of the Archaeological Chemistry Laboratory at the University of Wisconsin and I are working on organizing the next **ACS Archaeological Chemistry Symposium** for 2013. Watch here for more information as the plans develop!

In the meantime, if you'll be at the ACS Spring Meeting in Anaheim, you should check out the symposium, sponsored by the Division of Analytical Chemistry, entitled "***Partnerships and New Analytical Methodologies at the Interface of Chemistry and Art.***"

Publications

Because of the sheer volume of publications related to archaeological chemistry, I will not try to address each paper that may be of interest, with one exception in this report. However, special issues of several analytical chemistry journals with archaeological chemistry themes or applications are worth noting.

The September 2010 issue of the *Journal of Archaeological Method and Theory* was a special issue on "**Innovations in the Chemical Analysis of Activity Areas,**" edited by SAS President Sandra L. López Varela and Christopher D. Dore.

The March 10, 2010 issue of *Accounts of Chemical Research* had the theme "**Advanced Techniques in Art Conservation**." Several of the papers therein address methods for nondestructive analysis of organic materials, where innovative developments in archaeological chemistry are occurring.

The July 2009 issue of *International Journal of Mass Spectrometry* was a special issue on "**Art and Cultural Heritage**." In addition to many papers on artist's materials, the issue includes papers on new mass spectrometric techniques for residue analysis.

I will single out one recent paper from a journal that may not be on most archaeological scientist's radar. **Characterization of Plant Exudates by Principal-Component and Cluster Analyses with Nuclear Magnetic Resonance Variables**, by Joseph B. Lambert, Eric A. Heckenbach, Yuyang Wu[†], and Jorge A. Santiago-Blay in the *Journal of Natural Products* is of interest for two reasons. First, NMR spectroscopy is not a technique that is widely used in archaeological chemistry, but is extremely valuable in characterizing organic compounds. And second, because Lambert and Santiago-Blay have requested samples of gums, resins, etc. for their ongoing work in creating a comprehensive NMR library (see the News and Notes on p. 57 of the September 2010 *SAA Archaeological Record*).

An electronic book from Springer, **A Consumer's Guide to Archaeological Science: Analytical Techniques** by Mary E. Malainey may be a source of information on analytical chemistry methods relevant to archaeological applications. At press time, I have been unable to access the e-book, so further discussion will have to wait for the next *Bulletin*. Thanks to Rachel Popelka-Filcoff for the tip that this book was coming out.

ARCHAEOMETALLURGY

Thomas R. Fenn, Associate Editor

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

New Books

Mining Archaeology in the American West: A View from the Silver State, by Donald L. Hardesty, University of Nebraska Press and the Society for Historical Archaeology, Lincoln, Nebraska, 2010. *Historical Archaeology of the American West* series, xvii+220p., ill., maps, ISBN: 9780803224407; 0803224400, $45.00 (cloth : alk. paper). Mining played a prominent role in the shaping and settling of the American West in the nineteenth century. Following the discovery of the famous Comstock Lode in Nevada in 1859, mining became increasingly industrialized, changing mining technology, society, and culture throughout the world. In the wake of these changes Nevada became an important mining region, with new people and technologies further altering the ways mining was pursued and miners interacted.

Historical archaeology offers a research strategy for understanding mining and miners that integrates three independent sources of information about the past: physical remains, documents, and oral testimony. Mining Archaeology in the American West explores mining culture and practices through the microcosm of Nevada's mining frontier. The history of mining technology, the social and cultural history of miners and mining societies, and the landscapes and environments of mining are topics examined in this multifocus research. In this updated and expanded edition of the seminal work on mining in Nevada, Donald Hardesty brings scholarship up to the present with important new research and insights into how people, technology, culture, architecture, and landscape changed during this period of mining history.

New Articles/Book Chapters

The recent book ***Social Complexity in Prehistoric Eurasia: Monuments, Metals, and Mobility***, edited by Bryan K. Hanks and Katheryn M. Linduff, Cambridge University Press, Cambridge/New York, 2009 contains a section entitled: "Mining, Metallurgy, and Trade." This section includes six contributions focusing on Eurasian metallurgical resources and trade networks. The contributions comprise "Introduction" (Katheryn M. Linduff; pp. 107-114), "Formation of the Eurasian Steppe Belt Cultures: Viewed through the Lens of Archaeometallurgy and Radiocarbon Dating" (Evgenii N. Chernykh; pp. 115-145), "Late Prehistoric Mining, Metallurgy, and Social Organization in North Central Eurasia" (Bryan K. Hanks; pp. 146-167), "The Bronze-Using Cultures in the

Northern Frontier of Ancient China and the Metallurgies of Ancient Dian Area in Yunnan Province" (Rubin Han and Xiaochen Li; pp. 168-186), "Production and Social Complexity: Bronze Age Metalworking in the Middle Volga" (David L. Peterson; pp. 187-214), and "Early Metallurgy and Socio-Cultural Complexity: Archaeological Discoveries in Northwest China" (Jianjun Mei; pp. 215-232).

From the recent book ***Natural Heritage from East to West: Case Studies from 6 EU Countries***, edited by Niki Evelpidou, *et al.*, Springer-Verlag, Berlin/Heidelberg, 2010, come a couple chapters on ancient mining sites: "The Lavrion Mines" (Athanassios Katerinopoulos; pp. 27-33), and "Ancient Gold Mining in Rosia Montana (Apuseni Mts, Romania)" (Dumitru Ioane, Horea Bedelean; 95-99).

In 2009 the *Journal of World Prehistory* (Vol. 22) produced two issues, September (No. 3, Special Issue: ***Modelling Early Metallurgy I***) and December (No. 4, Special Issue: ***Modelling Early Metallurgy II***), edited by Christopher P. Thornton, dedicated to recent reviews and updates on global archaeometallurgy. Contributions to the first such issue comprised "Introduction: The Beginnings of Metallurgy in Global Perspective" (Christopher P. Thornton and Benjamin W. Roberts; pp. 181-184), "West Mexican Metallurgy: Revisited and Revised" (Dorothy Hosler; pp. 185-212), "Copper Working Technologies, Contexts of Use, and Social Complexity in the Eastern Woodlands of Native North America" (Kathleen L. Ehrhardt; pp. 213-235), "Production and Consumption of Copper-base Metals in the Indus Civilization" (Brett C. Hoffman and Heather M.-L. Miller; pp. 237-264), "Metallurgy in Ancient Eastern Asia: Retrospect and Prospects" (Katheryn M. Linduff and Jianjun Mei; pp. 265-281), "New Light on the Development of Chalcolithic Metal Technology in the Southern Levant: (Jonathan Golden; pp. 283-300), and "The Emergence of Complex Metallurgy on the Iranian Plateau: Escaping the Levantine Paradigm" (Christopher P. Thornton; pp. 301-327). Contributions to the second dedicated issues consisted of "From Scale to Practice: A New Agenda for the Study of Early Metallurgy on the Eurasian Steppe" (Bryan Hanks and Roger Doonan; pp. 329-356), "The Transmission of Early Bronze Technology to Thailand: New Perspectives" (Joyce C. White and Elizabeth G. Hamilton; pp. 357-397), "Cairo to Cape: The Spread of Metallurgy Through Eastern and Southern Africa" (David Killick; pp. 399-414), "Early West African Metallurgies: New Data and Old Orthodoxy" (Augustin F. C. Holl; pp. 415-438), "Early Metal in South India: Copper and Iron in Megalithic Contexts" (Praveena Gullapalli; pp. 439-459), and "Production Networks and Consumer Choice in the Earliest Metal of Western Europe" (Benjamin W. Roberts; pp. 461-481).

A recent review article in the journal *Spectrochimica Acta Part B: Atomic Spectroscopy*, 2010, 65(9-10):769-786, is "**Determination of isotope ratios of metals (and metalloids) by means of inductively coupled plasma-mass spectrometry for provenancing purposes – A review**" (L. Balcaen, L. Moens, & F. Vanhaecke), and from *Applied Spectroscopy*, 2010, 64(4):384-390, comes "Chemical Attribution of Corroded Coins Using X-ray Fluorescence and Lead Isotope Ratios: A Case Study from First Century Judaea" (Michael S. Epstein, David B. Hendin, Lee L. Yu, Nathan W. Bower). In the *Journal of Applied Electrochemistry*, 2010, 40(2):345-356, is "Electrochemical assessment of the restoration and conservation of a heavily corroded archaeological iron artifact" (M. Hernandez-Escampa, J. Gonzalez, J. Uruchurtu-Chavarin), while in *Microchimica Acta*, 2010, 168(3-4):283-291, is "Identification of ancient gilding technology and Late Bronze Age metallurgy by EDXRF, Micro-EDXRF, SEM-EDS and metallographic techniques" (Elin Figueiredo, Rui J. C. Silva, M. Fátima Araújo, João C. Senna-Martinez). From the journal *Environmental Science and Pollution Research*, 2010, 17(1):165-180, comes "Metallurgy, environmental pollution and the decline of Etruscan civilisation" (Adrian P. Harrison, Ilenia Cattani, Jean M. Turfa).

In the journal *Archaeological and Anthropological Sciences*, 2010, 2(3):191-215, is "**Mineralogical and geochemical characterization of high-medieval lead–silver smelting slags from Wiesloch near Heidelberg (Germany)—an approach to process reconstruction**" (Florian Ströbele, Thomas Wenzel, Andreas Kronz, Ludwig H. Hildebrandt, Gregor Markl). From the *Oxford Journal of Archaeology*, 2010, 29(2):175-202, comes "New Approaches on the Archaic Trade in the North-Eastern Iberian Peninsula: Exploitation and Circulation of Lead and Silver" (Núria Rafel, *et al*.). From the *European Journal of Archaeology*, 2010, 13(2):195-216, comes "The Mining Complex of Braçal and Malhada, Portugal: Lead Mining in Roman Times and Linking Historical Social Trends — Amphitheatre Games" (Carla Maria Braz Martins). From *EuroREA: (Re)construction and experiment in archaeology - European platform*, 2010, 7:4-8, comes "Experimental ironmaking once more: combining theory and find material" (Arne Espelund). From *The European Archaeologist: Newsletter of the European Association of Archaeologists*, 2009/2010, No. 31:8-9, comes "The Gresham Shipwreck: an investigation into the iron bars – research so far" (Thomas Birch). In the *Journal of African Archaeology*, 2009, 7(1):99-105, is "Dating the Mapungubwe Hill Gold" (Stephan Woodborne, Marc Pienaar, Sian Tiley-Nel). From *Nyame Akuma*, 2010, no. 73, comes "Métallurgie du fer en Afrique: un champ de convergence des sciences sociales, physiques et de la nature" (Martin Elouga). In *Latin American Antiquity*, 2010, 21(1):22-43, is "Craft specialists at Moche: organization, affiliations, and identities" (Helene Bernier). Also, from *Studies in Conservation*, 2010, 55:3-19, comes "A Lydian Bed of Iron, Bronze and Copper: Technical Examination of a Metallurgical Masterpiece" (David A. Scott, Jeffrey P. Maish).

From the *Bulletin de la Société préhistorique française*, in 2010, no 107(3), comes "**Une tuyère du Bronze ancien à la Bastide Neuve II (Velaux, Bouches-du-Rhône): Un témoin d'activité métallurgique en contexte domestique en Provence occidentale ? Remarques sur les tuyères en céramique d'Europe occidentale**" (Thibault Lachenal, Véronique Rinalducci de Chassey, Karine Georges, Jean-Philippe Sargiano; pp. 549-566); from the 2009 volume, no. 106(3), comes "Approche pluridisciplinaire d'un ensemble d'objets métalliques de l'Âge du bronze découvert à Soulac-sur-Mer (Gironde, France)" (Céline Lagarde, Michel Pernot;

pp. 553-468), and from no. 106(1) comes "Aux origines des techniques minières. L'exploitation d'un gisement filonien au Premier Âge du fer. Les mines de Silter di Campolungo et de Baita Cludona di Fondo (Val Camonica, Alpes lombardes, Italie)" (Denis Morin, Marco Tizzoni; pp. 109-141), and "Vers une histoire de la production du fer sur le plateau de Bandiagara (pays dogon, Mali) durant les empires précoloniaux : Peuplements des forgerons et traditions sidérurgiques" (C. Robion-Brunner; pp. 156-158).

Contributions to *Archaeometry* in the past year include a few articles relevant to archaeometallurgy. These are listed in order from most recent (dating to the 2010, Vol. 52, December issue, No. 6). From issue No. 6 comes "**An Elemental and Lead-Isotopic Study on Bronze Helmets from Royal Tomb No. 1004 in Yin Ruins**" (J. H. Tian, Z. Y. Jin, R. L. Li, L. F. Yan, J. Y. Cui; pp. 1002-1014), and "**Archaeomagnetic Dating of Copper Smelting Site F2 in the Timna Valley (Israel) and its Implications for the Modelling of Ancient Technological Developments**" (E. Ben-Yosef, L. Tauxe, T. E. Levy; pp. 1110-1121). From issue No. 5 comes "**Tin Isotopy—A New Method For Solving Old Questions**" (M. Haustein, C. Gillis, E. Pernicka; pp. 816-832), and from issue No. 1 "**Tools to Qualify Experiments with Bloomery Furnaces**" (M. Senn, U. Gfeller, B. Guénette-Beck, P. Lienemann, A. Ulrich; pp. 131-145).

Contributions to the *Journal of Archaeological Science* over the past year include a number of articles relevant to archaeometallurgy. These are listed in order from most recent (dating to the 2010, Vol. 37, December issue, No. 12). From issue No. 12 comes "**Direct detection of Southeast Asian smelting sites by ASTER remote sensing imagery: technical issues and future perspectives**" (T. O. Pryce, M. J. Abrams; pp. 3091-3098), while from No. 11 comes "**Technological traditions inferred from iron artefacts of the Xiongnu Empire in Mongolia**" (Jang-Sik Park, Eregzen Gelegdorj, Yeruul-Erdene Chimiddorj; pp. 2689-2697), and "**On the origins of extractive metallurgy: new evidence from Europe**" (Miljana Radivojević, Thilo Rehren, Ernst Pernicka, Dušan Šljivar, Michael Brauns, Dušan Borić; pp. 2775-2787). From No. 10 comes "**New insights regarding the Akko 1 shipwreck: a metallurgic and petrographic investigation of the cannonballs**" (E. D. Mentovich, D. S. Schreiber, Y. Goren, Y. Kahanov, H. Goren, D. Cvikel, D. Ashkenazi; pp. 2520-2528), while from No. 9 comes "**Metallurgical findings from a Viking Age chieftain's farm in Iceland**" (Sebastian K. T. S. Wärmländer, Davide Zori, Jesse Byock, David A. Scott; pp. 2284-2290). From No. 8 comes "**Technological continuity in Early Iron Age bronze metallurgy at the South-Western Iberian Peninsula – a sight from Castro dos Ratinhos**" (Pedro Valério, Rui J. C. Silva, António M. Monge Soares, Maria F. Araújo, Francisco M. Braz Fernandes, António C. Silva, Luis Berrocal-Rangel; pp. 1811-1819), and "**Lead pigments and related tools at Akrotiri, Thera, Greece. Provenance and application techniques**" (S. Sotiropoulou, V. Perdikatsis, Ch. Apostolaki, A. G. Karydas, A. Devetzi, K. Birtacha; pp. 1830-1840). From No. 7 comes "**Croatian Appoxiomenos alloy composition and lead provenance study**" (D. Mudronja, M. Jakšić, S. Fazinić, I. Božičević, V. Desnica, J. Woodhead, Z. A. Stos-Gale; pp. 1396-1402), "**The impact of mining activities on the environment reflected by pollen, charcoal and geochemical analyses**" (Elisabeth Breitenlechner, Marina Hilber, Joachim Lutz, Yvonne Kathrein, Alois Unterkircher, Klaus Oeggl; pp. 1458-1467), "**Smelting and recycling evidences from the Late Bronze Age habitat site of Baiões (Viseu, Portugal)**" (Elin Figueiredo, Rui J. C. Silva, João C. Senna-Martinez, M. Fátima Araújo, Francisco M. Braz Fernandes, João L. Inês Vaz; pp. 1623-1634), "**The technology of tin smelting in the Rooiberg Valley, Limpopo Province, South Africa, ca. 1650–1850 CE**" (Shadreck Chirikure, Robert B. Heimann, David Killick; pp. 1656-1669), "**Metallurgical investigations at Godin Tepe, Iran, Part I: the metal finds**" (Lesley Frame; pp. 1700-1715), and "**Khao Sam Kaeo – an archaeometallurgical crossroads for trans-asiatic technological traditions**" (Mercedes Murillo-Barroso, Thomas Oliver Pryce, Bérénice Bellina, Marcos Martinón-Torres; pp. 1761-1772). From No. 5 comes "**Arsenic accumulation on the bones in the Early Bronze Age İkiztepe Population, Turkey**" (Kameray Özdemir, Yılmaz Selim Erdal, Şahinde Demirci; pp. 1033-1041), while from No. 4 comes "**Concentrations of copper, zinc and lead as indicators of hearth usage at the Roman town of Calleva Atrebatum (Silchester, Hampshire, UK)**" (Samantha R. Cook, Rowena Y. Banerjea, Lisa-Jayne Marshall, Michael Fulford, Amanda Clarke, Cindy van Zwieten; pp. 871-879).

Ph.D. Theses

Reconstructing Early Islamic Maghribi Metallurgy. Martha Morgan (Doctoral dissertation, Department of Anthropology, The University of Arizona, Tucson, Arizona), 2009, 581p., 10 figures, 12 tables. Interactions in culture, science, and technology in early Islamic North Africa are studied through an examination of Maghribi metallurgy. My dissertation, based on the Social/Cultural Construction of Technology (SCOT) model (Bijker 1997), explores the impact of the Islamic religion and culture on scientific and technological change in the spheres of gold and silver minting, copper working, and iron smelting towards reconstructing the role and impact of metals in Islamic society. The purpose of my reconstruction is to define and contextualize early Islamic Maghribi metallurgy for a region and time period poorly defined in the history of metallurgical technology. The development of this history of technology involves the investigation of technical design within a religious framework, presenting explanations for the motivations of the use of certain metals from both their intrinsic and instrumental properties. This specialized history is important in that it provides information of significance on the larger scope of the history of technology and science and on the structure of Islamic society.

This study uses multiple lines of evidence, including historical documents, numismatic evidence, and archaeological data in an effort to situate the role of early Islamic Maghribi metallurgy into the framework of the history of African metallurgy. The religious and cultural meanings of metals are outlined through the compilation of their mention in the *qur'ān*, the *Hadīth*, and the chronicles of travelers. Coinage survey positions the

political and economic role of the Islamic state, and addresses the stability of western-periphery polities within the state and the concerns of a dogmatically-motivated bimetal system. The site of al-Basra, Morocco, a state mint under the Idrisid rule (A.D. 788-959), is the source for the excavated metal materials; the metal artifacts, unprocessed minerals, slag, non-metal tools associated with the metal production, and metallurgical facilities are described in their historical context.

This dissertation presents, for the first time ever, an English translation of *al-dawHa al-mushtabika fī DawābiT dār al-sika* (*The Intricate Tree in the Realm of the House of Minting*). This fourteenth century Arabic text details the meaning, production, and uses of metals in medieval Islamic society, and serves as a unit of study within Maghribi metallurgical technology. An ethnographic study of the metal artisans of Fès, Morocco provides a modern-day reflection to this reconstruction.

This study supports the SCOT methodology by identifying the relationships between scientific and technological practices and systems of belief. The Islamic culture and its practices -- which were part codified religion, part belief system -- were subject to change based on the contextual situations of the society. This study demonstrates that the society's metallurgical practices were subject to the same conditions. The metallurgical know-how within Islamic Maghribi society was, and is, a direct reflection of the unifying themes embedded in the culture.

Forthcoming Meetings and Conferences

The joint conference ***Preserving African Cultural Heritage***, of the ***13th Congress of the Panafrican Archaeological Association (PAA) for Prehistory and Related Studies*** and the ***20th Annual Meeting of the Society of Africanist Archaeologists (SAfA)***, will be held November 1-7, 2010 at UCAD II, University Cheikh Anta Diop, Dakar, Senegal. More information about registering for the event and other details can be found by visiting the following website: http://panaf-safa2010.ucad.sn/pag_en/en_home.html. Papers and posters related to ancient mining and metallurgy to be presented at the conference include "Metallurgy and urbanism in sub-Saharan Africa" (Shadreck Chirikure), "Compositions and Sources of Copper-Based Metals from the Middle Senegal River Valley" (Thomas R. Fenn, *et al.*), "Changes in the technology of iron smelting technology in the Senegal River valley from the mid-first millennium BCE to the late second millennium CE" (David Killick), "Progress in the DurbiTakusheyi Burial Project" (Detlef Gronenborn, Thomas R. Fenn, *et al*.), "Late Iron Age metal working in the Sand River valley, Southern Waterberg: Evidence from Rhenosterkloof 1 and 2" (Bandama Foreman), "Pre-colonial iron production in western Uganda: recent research and new perspectives" (Louise Iles), "De la nécessité d'intensifier la recherche sur les procédés de transformation du métal en sidérurgie directe et les mécanismes de leur transmission" (Elisée Coulibaly), "Production du fer au pays dogon (Mali) : traditions techniques et identité des métallurgistes" (Caroline Robion-Brunner), "L'apport de l'ethnoarchéologie des forges en Pays Dogon (Mali) à la compréhension des scories archéologiques" (Raphaëlle Soulignac), "Indigenous iron production in South Africa: the case of Rhenosterkloof, Limpopo province" (Bandama Foreman), and "Indigenous Iron smelting in Ethiopia: The role of ethnoarchaeology in preserving the disappearing knowledge among the Oromo of Wollega" (Temesgen Burka).

The third ***International Conference Archaeometallurgy in Europe 2011***, will be held from June 29-July 1, 2011 at the Deutsches Bergbau-Museum, Bochum, Germany. The previous two International Conferences, Archaeometallurgy in Europe I + II, were organized by the Associazione Italiana di Metallurgia in Milan (2003) and in Grado/Aquileia (2007), Italy. In the mean time research in our Scientific Community has produced significant results on early metal working and processing. The aim of this conference is to provide an overview of new insights and new approaches to the history of metallurgy in this part of the world. New regional studies, new instruments, and a changing pattern of research have clearly led to innovative scientific approaches to archaeometallurgy. This has long been a well established and most interesting field of research, and Europe has always been at the cutting edge.

The Conference will cover topics relevant to the investigation of the technology and diffusion of different metals and alloys used in ancient times, and of related (pre-) historic finds such as slag, furnaces, remains of production etc. It will present interdisciplinary scientific and archaeological investigations. The Conference Archaeometallurgy in Europe reflects the evolution of metallurgy in an area which due to its geographic and geological characteristics is exceptionally rich in ore deposits and looks back on an extraordinary development in metallurgy. Besides regional studies it will focus on new insights into the eastern part of Europe. More information about the conference can be found at: http://aie3.bergbaumuseum.de/tiki-index.php?page=1st%20Announcement.

Previous Meetings and Conferences

The ***International Congress on Archaeological Sciences in the Eastern Mediterranean and the Near East*** was held from April 29–May 1, 2010, at Paphos, Cyprus. This congress included several metallurgical sessions and papers. One session, entitled "Archaeometallurgy in the Eastern Mediterranean and the Near East" included the following papers: "Making and using weapons in Middle Bronze Age Byblos (Lebanon)" (Ziad El Morr, Michel Pernot), "New data on Pharaonic copper mines in South Sinai" (Pierre Tallet, Georges Castel, Philippe Fluzin), "Compositional Analysis of Late Cypriot Metalwork Using a Portable-XRF" (Georgios Papasavvas, Vasiliki Kassianidou, Alessandra Giumlia Mair), "Chemical and metallografic investigation carried out on the metallic artefacts from the Mycenaean settlement and cemetery of Lazarides on the island of Aegina – Greece" (Charilaos Tselios, N. Panayota Polychronakou Sgouritsa), "Lead isotopes technique for provenancing and in-direct dating, The iron ore mine of Mugharet al-Wradeh as a case study" (Yosha Alamri, Andreas Hauptmann), "Surface iron slags in non-'industrial' landscapes: developing a methodology in the context of the Kythera Island Project" (Myrto Georgakopoulou), "Mining and smelting landscapes in northern Greece: Investigation of

metallurgical residues of the Byzantine period" (Nerantzis Nerantzis), and "The sand casting workshops in Aleppo nowadays as a reflexion about 2nd millennium metallurgy" (Ella Dardaillon). Other metallurgical papers presented in a poster included "Results of WDXRF on Ten Piece of Iron Samples of Hassanlu IV" (Narges Heydari), and "Bas fourneaux à ventilation naturelle pour la réduction du minerai de cuivre (3000-2000 av. J.-C.) Ouadi Dara (Désert oriental, Égypte), bir Nasib (Sud Sinaï), Ayn Soukhna (Golfe de Suez)" (Pierre Tallet, Georges Castel, Philippe Fluzin). More information about the conference proceedings can be found at: http://icasemne.net/index.php?option=com_content&view=article&id=47&Itemid=1. A PDF containing abstracts for all the presented papers can be found at: http://icasemne.net/images/stories/Documents_word/Booklet_Abstracts_GG_10May.pdf.

The ***Symposium on the Metallurgy of the European Iron Age 2010***, was held at the Reiss-Engelhorn-Museen, in Mannheim, Germany from April 20-22, 2010. The scope and aim of the conference was that Iron Age societies in Europe are strongly associated with the historical Celts who populated Europe from Spain to Asia Minor and from the British Isles to Italy temporarily. This geographical and chronological outline was emphasized at this conference to illuminate the use, the production and the significance of various metals within different parts of the Celtic world. Nevertheless, as technological traditions of the beginning of the first millennium BC remained unchanged and as the Roman conquest did cause technological changes; these periods also were highlighted. Since there is substantial archaeological evidence for the interaction between the Celts and the Mediterranean world and also with its neighboring regions, regional and chronological differences in the use of metals should become apparent. Local ore mining and extractive metallurgy are regularly underestimated during this period and the participants will have the opportunity to open new vistas or certifying established views. It was the aim of the conference to bridge current scientific research on Iron Age metallurgy in different countries, to correct and to update our knowledge of European Iron Age metallurgy.

Papers presented in the Tuesday sessions included "Iron Age Metallurgy - a Question of Specialization?" (Diana Modarressi-Tehrani), "Mining and Metallurgy in the El Molar Area (Tarragona, Spain) during the First Iron Age" (Ignacio Montero-Ruiz, N. Rafel, X.L. Armada, R. Graells, M. Renzi, M. Murillo M.C. Rovira-Hortalá, S. Rovira), "Early Iron Age Silver Production in S.-W. Iberian Peninsula" (Mark. A. Hunt Ortiz), "Early Iron Age Metalwork from Thessali" (Thilo Rehren, Eleni Asderaki), "A chemical and technological study of the italic 'armour-discs' from the first Iron Age of the Fucino area of Abruzzo" (Maria Laura Mascelloni, Claudio Giardino), "Archaeometallurgical investigations on a recently found Late Bronze Age helmfragment of type 'Pass Lueg'" (Mathias Mehofer), "The Early Iron Age Hoard from Fliess in Tirol and Ore Sources of the Eastern Alps" (Joachim Lutz), "Iron Age non-ferrous metalworking in Britain - a review of the evidence" (Justine Bayley), "Iron in the Landscape of Iron Age East Yorkshire, UK" (Peter Halkon), and "Smelting Furnaces in Denmark" (Olfert Voss, Arne Jouttijärvi).

Paper from the Wednesday sessions included "New Artefacts in old Structures: The Iron Age Treasure of the Palacio III Megalithic Complex (Seville, Spain)" (Marcos Martinón-Torres, Mercedes Murillo-Barroso, Mark A. Hunt Ortiz), "Witnesses of complex Bronze Technology of the Celts: a boar headed Carnyx and a swan shaped Helmet from Tintignac" (Barbara Armbruster), "The unique Iron Age treasure from Snettisham: an investigation into a wide range of metalworking techniques" (Nigel Meeks, Aude Mongiatti, Duncan Hook and Caroline Cartwright), "The silver jewellery from the Zidovar treasure: alloys and appearances" (Jelena Zivković, Thilo Rehren, Milos Jevtic and Miljana Radivojević), "About the invention of wrought bronze alloys" (Jean-Marie Welter), "Iron Age Sheet Bronze Vessels of the British Isles" (Peter Northover), "Early Celtic Iron Production in the Northern Black Forest – Recent Research to the Neuenbürger Deposit" (Guntram Gassmann, Günther Wieland), "Research in Area processing of iron during the La Tène period: Preliminary results of surveys and excavations in Siegerland region, Germany" (Thomas Stöllner, Manuel Zeiler), "Circulation of Iron Semi-Products and Organisation of Production in the French Iron Age (VIIth - Ist C. B.C.)" (Marion Berranger, Philippe P. Fluzin), and "3D-tomography and XRD-studies on Iron Age brooches from Hänichen (Saxony/Germany)" (Klaus Bente, Marco Schrickel, J. Frase, A. Franz).

Contributions to the Thursday sessions consisted of "Silver Jewellery from the Late Iron Age to Roman Times in Middle Europe - Comparative Analysis on Manufacturing Techniques" (Birgit Schorer), "Some Metallurgical Aspects of Ancient Silver Coins discovered in Romania – The Case of Celtic-Type Geto-Dacian Coinage" (Bogdan Constantinescu, Viorel Cojocaru), "Smithing Slags in Celtic Rural Settlements: the Example of Courgevaux (Friobourg-Switzerland)" (Vincent Serneels), "Ferrum Noricum - 400 years of Roman Iron Production in Hüttenberg, Carinthia, Austria" (Brigitte Cech), "An iron-fibula work-shop in the Oppidum at Rheinau ZH , Switzerland" (Marianne Senn, Stefan Schreyer), "Resources and Recycling: Non-Ferrous Metals and Metalworking in the late Iron Age Oppidum of Manching (Bavaria)" (Roland Schwab), "Celts and Romans: the Contribution of Archaeometallurgy to Research into Cultural Interaction" (Janka Isteniè), "Archaeometrical Studies of Bronze Objects from a fired Domus Augustea in Cremona (Italy)" (Irene Calligari), and "Alloying traditions in the Roman Iron Age" (Arne Jouttijärvi).

The conference ***Métallurgie du fer et sociétés africaines : Bilans et nouveaux paradigmes dans la recherche anthropologique et archéologique / Iron Metallurgy and African Societies: Assessments and new paradigms in anthropological and archaeological research*** was held from April 23-24, 2010, at the Maison Méditerranéenne des Sciences de l'Homme, Aix-en-Provence, France. Papers presented on the first day of the conference included "La production sidérurgique du Sahel burkinabè dans son contexte historique de la fin de l'âge du Fer à l'aube du Moyen Age" (Jean-marc

Fabre), "The role of iron in foraging societies of northern Namibia in the 15th to the 20th century AD" (Eileen Kose), "De l'apparition et de l'expansion des groupes d'artisans endogames en Afrique : essai d'explication théorique" (Tal Tamari), "L'endogamie des forgerons au nord du Cameroun : origines, véhicules et usages d'un « concept » probablement exogène" (Olivier Langlois), "Les forgerons des Toubou" (Catherine Baroin), "Ironworking and African Societies: Comparison of Early & Later Iron Age Societies of the Bassar Region of Northern Togo" (Philip de Barros), "Les processus de spécialisation des forgerons bassar dans un contexte d'intensification de la production à la fin de la période précoloniale" (Stéphan Dugast), "La production ancienne du fer à Namoungou : une activité au service de la conquête royale" (Foniyama Elise Thiombiano), "Organisation spatiale de bas-fourneaux dans un bassin versant du sud ouest du Niger : analyse de la répartition des sites de métallurgie et des unités de production" (Rodrigue Guillon, Christophe Petit, Jean-Louis Rajot), "Lecture historique, économique et spatiale de la production sidérurgique : les sites de réduction du village de Wol (pays dogon, Mali)" (Caroline Robion-Brunner), "Utilisation des ressources boisées dans le cadre de la production du fer des sites de tradition Fiko : éléments nouveaux pour une reconstitution historique du paysage du pays dogon (Mali)" (Barbara Eichhorn), and "Bilan de recherche sur la sidérurgie directe du fer dans la province du Bulkiemde au Burkina Faso : un exemple d'approche pluridisciplinaire" (Timpoko Hélène Kienon-Kabore).

On the second day of the conference, papers included "Variability in pre- and early colonial iron production in the Mandara Mountains (Northeast Nigeria and Northern Cameroon)" (Nicholas David), "Variability and homogeneity over 2000 years of iron production in Southern Rwanda: evidence and interpretations" (Jane Humphris), "Variability in African bloomery smelting practices: insights from multivariate statistics" (Shadreck Chirikure), "La paléométallurgie du fer dans la province du Bam (Burkina Faso) : L'identité des acteurs et la mobilité des techniques" (Salif Noaga Birba), "Les mécanismes de la transmission des connaissances techniques chez les anciens métallurgistes du fer du Bwamu (Burkina Faso - Mali)" (Elisée Coulibaly), "Itinéraire d'accumulation du savoir et du savoirfaire chez les métallurgistes Dii du Nord Cameroun" (Sardi Abdoul Innocent), "The archaeology of iron production in Ethiopia: An ethnoarchaeological perspective on technological variability in iron smelting technology among close lineages of smelters in Wollega, west Ethiopia" (Temesgen Burka), "Traditional Bloom Refining Technology in Central and East Africa" (Edwinus C. Lyaya, Bertram B. Mapunda, and Thilo Rehren), "Technological style in pastoralist iron production of the Laikipia Plateau, Kenya" (Louise Iles, Paul Lane), "Pourquoi les techniques métallurgiques sont-elles affaire de style ?" (Bruno Martinelli), "Anthropologie, ethnohistoire, ethnoarchéologie et archéologie du fer : quelle place accorder au discours des acteurs ?" (Alain Gallay), "La réduction du minerai de fer en Pays dogon (Mali): un apprentissage entre croyances et savoir-faire" (Eric Huysecom), and "La réduction métallurgique : des sens aux savoirs transmis" (Philippe Andrieux).

BOOK REVIEWS

David Hill, Associate Editor

As the new Reviews Editor, I can happily say that I have finally matched reviewers with all of the books in the backlog. So consider this call for more publications. I would especially like to solicit publications that I believe are under-represented in the review section of the *SAS Bulletin*; publications that are not published in English and publications from non-western or smaller institutions. If you know of such publications, please pass them on to me. Also, as space in the *SAS Bulletin* allows, I would also like to include reviews of on-line publications that relate to archaeological science as well. If you know of scholars that would be interested in serving as reviewers of such works, please have them contact me at dhill1@att.net.

Reviews are an important component of our bulletin. I have purchased several publications as the result of reading the reviews that have been published in the *SAS Bulletin*. In several cases, these were publications that I would not have otherwise not known about or would have considered outside of my areas of interest. The review section of the *SAS Bulletin* is something that all members can contribute to and learn from.

***The Ancient Southwest*: *Chaco Canyon, Bandelier and Mesa Verde*.** David E. Stuart, University of New Mexico Press, Albuquerque. 2009. 152 pages, 26 halftones, 8 maps. ISBN: 978-0826346384.

Reviewed by Mark E. Harlan, Independent Researcher. 2916 Palo Alto Drive, NE, Alburquerque, NM 87112.

Given the readership of this journal, it seems best to begin by stating what Stuart's book is not. It is not a brief compendium of Southwestern prehistory, a specific set of compelling insights into the prehistoric occupations at Chaco Canyon, Bandelier and Mesa Verde nor is it a general discussion of the current state of research in the Southwest. Stuart sums it up in his preface: "…this collection does not constitute a textbook approach to our region's past. These essays are interesting vignettes about the 'Ancient Southwest.'" While the character of the book may limit its utility for the readers of this journal, my review is confined to an assessment based on the book Stuart has chosen to write.

The book is clearly a delightful read. Stuart has collected 23 essays which were originally written as articles prepared for publication in New Mexico's small town newspapers. The book organizes the essays into five groupings titled, I) A Land Rich in Archaeological Heritage, II) Classic "Hunting" Society, III) Twilight of "Hunting Society" and the Dawn of Agriculture, IV) Chaco and Mimbres: Heyday of the *Ancient Southwest* and V) After the Fall of Chaco and Mimbres Society. The overall effect is a loose temporal narrative that follows the "striving to achieve civilization" paradigm commonly held among Southwesterists up through the 1970s. Stuart conveys his narrative journalistically, as one would expect given the essays' pedigree. The author's intent is more to entertain than

to edify, as clearly stated in the preface but, like all good journalism, the goal is also to be factual and to inform. Evaluated as journalism, the book has some shortcomings since it is not fully accurate on the facts and does not sum up to a cogent characterization of its subject matter.

Small lapses in factual accuracy set the tone for larger mischaracterizations of the overall course of Southwestern prehistory. A few examples: On page 64, Stuart recounts a day he was excavating near Farmington, NM when the radio "blared" a temperature soaring to 108. The recorded all time high for Farmington is 103. In Stuart's defense, whatever the actual temperature was that day, I am sure it felt a lot hotter. Moving from the mundane to the germane, on page 91 Stuart characterizes the distribution of the Mogollon culture as centered in the Gila Wilderness of New Mexico, extending north to Socorro, NM and south down into old Mexico. This is strange, given his recognition of Emil Haury's pioneering efforts (on just the previous page) and Haury's definition of the Mogollon culture based on sites he located in Arizona, the culture area's epicenter. The most egregious mischaracterization of Southwestern prehistory follows quickly on page 92. Here Stuart characterizes the Jornada Mogollon as "…one of the least known archaeological frontiers in North America." Only the most narrowly focused academic archaeologist could make such a statement, ignoring the massive efforts of the hundreds of contract archaeologists who have surveyed, excavated and meticulously reported on thousands of sites, making the Jornada Mogollon the most data-rich and carefully interpreted culture area in the Southwest, if not all of North America. Stuart's mischaracterization results from a narrow focus on the work of academics which is inexplicable, given his start in archaeology at the University of New Mexico's Office of Contract Archaeology. These factual lapses and mischaracterizations are not consistent with good journalism and Stuart's archaeological interpretations of the Southwestern sequence are also flawed.

Granting *The Ancient Southwest's* intent to inform the general public about Southwestern prehistory while keeping them sufficiently entertained to read the book, my main objection is Stuart's perpetuation of the myth that the Southwest was a place where everything important happened within the masonry walls of large pueblo settlements. Beginning with Adolf Bandelier (a pioneer praised by Stuart), many Southwesternists have been seduced by the mystery of impressive masonry structures that were abandoned rapidly while still in good repair. Like Stuart (see his essays in parts II and III of *The Ancient Southwest*), they have been aware of the many smaller sites created by prehistoric people who did not live in the pueblos but see them mainly as evidence of those who strove to be Chacoans or Mesa Verdeans but lived too soon or hung on pitifully after the failure of those grand experiments. Even as a discussion of Southwestern "big site" archaeology, the book falls short of expectations based on its title. The view is narrowly focused on the Four Corners region and short sighted even at that. The Hohokam are barely mentioned and the discussion of the Mogollon leaves the impression that developments began and ended in the Mimbres region. Take away their pretty bowls and the Mimbres Mogollon folks look like poor cousins of the people who occupied Grasshopper Pueblo and Kinishba.

This leaves the role of Stuart's book as a personal memoire documenting a brief golden age of contract archaeology, before bureaucratization transformed it from a research endeavor to an exercise in accountancy and land management. As a participant in the same times and events as Stuart, I find his work lacking from this perspective as well. Even refocusing for Stuart's Four Corners myopia, he might have praised his old friends Mike Marshall and John Stein for their considerable contributions rather than highlighting John Brooster, who left New Mexico to serve historic preservation concerns in Tennessee more than 20 years ago and Rory Gauthier, who has spent more of his career as a Park Ranger than in the trenches of contract work. At the bottom line then, those who choose to acquire and read *The Ancient Southwest* should admire its craftsmanship while taking its content with the proverbial grain of salt.

Designing Experimental Research in Archaeology: Examining Technology through Production and Use. Jeffrey R. Ferguson, editor. University Press of Colorado, Boulder 2010 University Press of Colorado, Boulder. 2010. 262 pp. ISBN: 978-1607320227.

Reviewed by Eric Blinman, Museum of New Mexico, Office of Archaeological Studies, PO Box 2087, Santa Fe, NM 87504-2087.

Experimentation has an important if occasionally embarrassing role the archaeological study of past technologies. This self-reflective ambivalence is inherent and even desirable, as documented in the diverse contributions to this volume. The importance of experimental research is reflected in a strong and growing body of both method and theory, much of it codified by the work of Michael Schiffer and his students from the Laboratory of Traditional Technology at the University of Arizona. The occasional wackiness of experimental research is vital to break the constraints of "normal science," the intellectually dangerous tendency to suspend research and become complacent once an expected result is achieved. Goals of experimentation range from the idiosyncratic understanding of the function of a single artifact, to the validation and calibration of whole classes of archaeological analyses, to developing arguments that explain historical change (evolution) in past economies.

The strengths of this volume are its contributions, both individually but most importantly in the aggregate. After an introduction by Erik J. Marsh and Jeffrey R. Ferguson, theoretical, methodological, and case discussions touch on pottery production and use (Karen G. Harry and Margaret E. Beck); flaked stone tool reduction, wear analysis, and heat treatment (Philip J. Carr, Andrew P. Bradbury, Douglas B. Bamforth, Robert J. Jeske, Daniel M. Winkler, and Dustin Blodgett); ground stone wear studies (Jenny L. Adams), perishables (Edward A. Jolie and Maxine E. McBrinn), weapon systems (John Whittaker), and animal bone as raw material and

food waste (Leland C. Bement, Patrick M. Lubinski, and Brian S. Shaffer).

Common threads include an explicit or implicit concern with equifinality, the reality that multiple pathways can lead to the same end products, whether those products are artifact designs, wear patterns, or assemblage compositions. Ironically, pitfalls are great when rigor is imposed on the theory and mechanics of experimental design. Tight control of a few potentially important variables can lead to misleading conclusions if the researcher has failed to anticipate all relevant variables or the complexities of variable interactions. And yet, designs that realistically accommodate many variables can stall in a morass of confusing variable relationships. Most vexing is that experiments often require a mastery of basic fabrication skills, skills that are rare or that are themselves variables that need to be considered. Similarly, researchers working in isolation often become both expert and too narrow in their perspectives.

Perhaps the biggest challenge for experimental research is the closet nature of much of the activity (I confess my own guilt). Much research takes place over decades, is full of negative and even embarrassing results, and documentation is sporadic and inadequate. In contrast, discrete well-documented experiments are often rendered trivial or naïve by their very narrowness. Peer-reviewed journals would be overwhelmed and would rightfully reject the publication of much experimental work, yet both the volume and variety of approaches to studying a given problem are essential to interpretive progress. The volume correctly stresses the need for high quality documentation, but no one has proposed a solution to the dilemma of archiving and sharing experimental results.

I recommend this book highly to researchers involved in or contemplating programs of experimental archaeology. It should be read in its entirety rather than just the chapters that appear to be relevant to a given material culture class. Ground stone and ceramic studies include concepts and methods that can broaden and improved. The chapters on the analysis of flaked stone and bone studies can also be used to develop future research. The weapon systems paper is a valuable reminder of how a simple tool, the atlatl, is part of an incredibly complex suite of cultural behaviors, with different implications depending on the cultural-environmental context of its use.

Dietary, Environmental, and Societal Implications of Ancient Maya Animal Use in the Petexbatun: A Zooarchaeological Perspective on the Collapse. Kitty F. Emery. Vanderbilt University Press, Nashville. 2010. xvii + 366 pp. ISBN 978-0-8265-1646-6.

Reviewed by Carolyn Freiwald, University of Wisconsin – Madison. Department of Anthropology, 5240 WH Sewell Social Science Building, 1180 Observatory Drive, Madison, WI 53706.

Kitty Emery has been at the forefront of new and sophisticated zooarchaeological analyses that address questions beyond dietary preference and ritual significance of animals. Her monograph uses chemical and zoological techniques to evaluate potential causes for the Maya collapse. Emery's purpose is two-fold: to show the depth and breadth of modern zooarchaeological techniques and to explain how a multi-faceted faunal analysis can contribute to broad theoretical questions.

The Petexbatun region of the Maya Lowlands in northern Guatemala is an area well-suited to study of the collapse. This monograph is part of a series that presents the results of multi-disciplinary research efforts in the region, which show strong evidence for an early and dramatic collapse, including defensive structures and in situ deposits left during rapid abandonment. Emery presents three models that predict how animal use patterns would reflect commonly cited causes for the collapse: environmental degradation, dietary failure, and socioeconomic change. She focuses on seven sites excavated as part of the Petexbatun Regional Archaeological Project, using faunal data that span the Preclassic to Postclassic periods (900 B.C. to A.D. 1500).

Her first model suggests that environmental degradation would result in the presence of more diverse species, especially those from disturbed habitats. However, neither climate change nor extensive anthropogenic modification of the landscape is visible in ecosystem fidelity analyses or isotopic evaluation of animal diet. Instead, Emery finds no significant change in animals from disturbed landscapes and no evidence for increased use of favored animals like white tail deer (*O. virginianus)* and turtle. There is no 'famine response' in food choices. Nor do carbon isotope values of 60 whitetail deer samples show a picture of agricultural extensification that would support a theory of environmental collapse. Variability instead seems to stem from different microenvironments present near each site.

The dietary failure model also should reflect a change in animal use and processing techniques, as seen in elemental distribution and post-capture bone modification. However, Emery sees no evidence for overhunting or internal competition for scarce animal resources prior to the collapse. Animal bones are an indirect measure of diet, so Emery discusses the results in the context of osteological analyses of human remains across the lowlands.

The socioeconomic collapse model, in contrast, is in part supported by the faunal evidence. Emery predicts increasing acquisition of high-status and exotic artifacts and a post-collapse economic change. Her evidence is drawn from a remarkable worked bone assemblage at the site of Dos Pilas. The fauna show a clear focus on standardized production of utilitarian artifacts, with selective importation of specific elements for extra-household manufacture that suggest a shift toward commercialization of the economy. She sees similar patterns in assemblages at Tikal and Uaxactun, but notes that contrasting trends in ceramic data illustrate the need for further investigation.

The book is divided into eight chapters and two appendices. The first two chapters provide an introduction to the main

questions surrounding the Maya collapse and provide the cultural and ecological background of the study region. Chapter 3 outlines the methods used, including very detailed information on both recovery and analysis. Emery then describes how she chose the subsets of the zooarchaeological assemblage used to test the predictions of each model, including the categories of faunal analysis (i.e., MNI, NSP, etc.) and the specific statistical assays for each question. These are succinct descriptions that she expands on in chapters 5, 6, and 7.

Chapter 4 provides a taxonomic overview of the faunal assemblage in both narrative and graphic form, with additional detail included in two appendices organized by site and context. Chapters 5, 6, and 7 provide the main data analysis and interpretation in the book. At the end of each chapter, a summary of the results provides some of the best discussions in the book. Emery summarizes these conclusions in the final chapter.

This is the first use of faunal evidence to explore causes for the Maya collapse. While evidence from a single material cannot resolve such a complex question, animal use is central to many contributing causes. In fact, zooarchaeological evidence is commonly ignored, even for research on feasting, where food use forms a central part of the question. Perhaps this will be remedied by use of Emery's detailed methods section, which provides a useful guide for incorporating faunal analysis into the research design from the earliest stages.

Emery's application of ecological methodologies changes the focus from use of a particular species to whole ecosystems. She applies multiple statistical assays to each dataset: this makes a difference in her interpretations. Some trends that appear to support environmental or dietary collapse using a single statistic are not considered significant when stricter measures are applied.

Her use of carbon isotopes to assess the contribution of C4 foods to the diet of wild game, while not new, is unique in the Maya area as a method of reconstructing the local environment. Emery assumes that animals were acquired locally and can serve as proxies for the local landscape, a problem that is not addressed in-depth. However, publications elsewhere provide results of strontium measures, which are used to identify origin and migration (Thornton 2007; Emery and Thornton 2008).

The most important contribution in the volume may be the detailed sequence for bone tool production. The study of Maya bone tool production is also covered in her dissertation and other publications. However, the background and interpretations are enhanced with more recent research and presented in greater detail than is possible in a journal article.

Animal use provides information central to human diet and the environment, and her methods are easily applied elsewhere in the Maya lowlands. A single bone working context may not be sufficient to understand broad economic change, an observation Emery makes herself. However, her goals for the book were more modest, and she succeeds in contributing a unique perspective on the Maya collapse.

Paleoimaging: Field Applications for Cultural Remains and Artifacts. Ronald G. Beckett and Gerald J. Conlogue. CRC Press, Boca Raton. 2010. 405 pp. ISBN: 978-1-4200-9071-0.

Reviewed by Douglas B. Hanson, The Forsyth Institute. 245 First Street, Cambridge, MA 02142.

This volume is a superb reference for archaeologists and bioarchaeologists as well as others interested in utilizing an array of imaging technologies for fieldwork and museum studies. Both authors have an extensive background in radiography and endoscopy and their use in field and museum studies

The book is divided into four sections: (1) *Paleoimaging Multimodalities; (2)Paleoimaging Standards;* (3) *Artifact Analysis;* and (4) *Safety in the Field Setting;* The book is accompanied by a DVD containing a MOV file, narrated by the authors showing stills demonstrating multimodal imaging in various field settings. The first section focuses on four paleoimaging modalities including photography, conventional radiography, computer-based imaging, and endoscopy. This book makes the logistics of managing these imaging modalities in the field seem somewhat less daunting for those of us who have packed generators into the field to power some of our equipment. The authors advocate putting together a paleoimaging team, members of which are well-versed in the use of these technologies in the field. Such a team would consist of paleoimagers who collect data and a paleoimaging interpreter (in most cases a radiologic technician) who would assist the archaeologist, paleopathologist and bioarchaeologist with interpretation of the images.

In Chapter 1, the importance of field photography is stressed. Not only does the photographer help document the regional environment and the archaeological context, but the photographer works with paleoimagers who rely on them for documenting the specialized setups needed for paleoimaging. Many of the chapters are illustrated with B/W photographic images showing these specialized setups in some detail.

Chapter 2 focuses on the use of conventional radiography in the field. Applications include x-rays of mummified material, *in situ* skeletal remains, grave goods, and other artifacts. The chapter also includes an important, in-depth discussion of radiographic penetration and exposure variables in field settings. Specific considerations for field imaging range from the portability of radiographic units, mounting the radiographic unit, reliability of power in remote settings, positioning human remains or artifacts, image receptors, and field darkrooms.

Depending on the research design, the authors make a good case for the use of conventional radiography as the primary imaging modality used on site, especially when mummified remains are involved. The authors are concerned about the loss of data once the remains are removed from their burial context. Radiography can assist with assessment of the condition of the remains prior to removal. Several excellent case studies show how x-rays can provide more detailed taphonomic and biological data (e.g. age at death) and help field researchers

determine the fragility and integrity of the remains or artifacts under investigation.

Chapter 3 provides an overview of computer-based imaging. Although the focus of the book is on paleoimaging in a field setting, this chapter provides a more technical perspective on computerized imaging modalities. The two major categories of computer-based imaging (CBI), computed tomography (CT), and digital image receptor (IR) which includes computed radiography (CR) and direct digital radiography (DR) are considered in some depth. Finally this chapter presents a detailed and useful discussion of the use of Magnetic Resonance Imaging (MRI) for analysis of mummified remains.

The final chapter (Chapter 4) in this section on imaging modalities focuses on endoscopy in both field and laboratory settings. Endoscopy can assist with finding the best sampling site in mummified remains to recover tissue used in biopsies. This chapter shows how well imaging modalities complement one another, particularly conventional radiography and endoscopy. The authors demonstrate how the use of x-rays and endoscopy together can inform the investigator on burial practices, mummification methods, age at time of death, pathology, including dental pathology, and in some cases, cause of death. They also describe an emerging application for endoscopic study of mummified remains: endoscopic-guided light reflectance/absorption analysis. The application of this type of light reflectance theory is based on the notion that all tissues and organs are chemically different and may absorb and reflect different wavelengths of the spectra. Several experiments are described which test whether dessicated organs and tissues can be differentiated based on their reflectance. Using videoendoscopy with filtered light, it is possible differentiate organs and tissues in mummified remains

The second section of the book is devoted to paleoimaging procedures and standards for each imaging modality. The authors argue that methodological and procedural standards for imaging are often overlooked or just don't make their way into final reports. The guidelines and procedures set forth in this section are intended to help those involved in paleoimaging research projects make decisions on how to approach a specific research problem. Decisions regarding instrumentation, image receptor selection, projections, approaches to biopsy, and other variables associated with paleoimaging are presented. The guidelines detailed in this section also emphasizes the need for standardized reporting of paleoimaging procedures and data. Standardization of procedural practices is intended to increase the reproducibility of paleoimaging data collection in different research settings. The authors note that the standards presented in this section are not to be viewed as directives. Instead they should serve as a starting point for improving the quality of paleoimaging applications.

Artifact analysis using multimodal imaging is detailed in the third section of this book. This section begins by showing how paleoimaging is used to obtain data from various artifacts. The authors focus primarily on multimodal image analysis of grave goods associated with mummy bundles. They distinguish between *internal context* artifacts contained in the body cavity or in the burial wrappings, and external context artifacts. External context artifacts are associated with the mummy itself but not contained in wrappings and body cavity.

The final section deals with field paleoimaging safety and health challenges. This is essentially a primer on health and safety in remote field settings. Many of the practical considerations and challenges for field paleoimaging and how these challenges can be overcome are discussed. Several pages of this section are devoted to radiation protection and safety.

This book is an excellent resource for any project team considering the use of multimodal imaging in the field, laboratory, or museum. The book is well-written and provides sufficient detail on the use of these imaging methods to assist with project planning. The book also contains dozens of black and white images, many of which show the specialized setups used for best results. Twenty-one color plates are also included in the volume. My only disappointment with the book is that it lacked a list of figures. Aside from the accompanying DVD, The book also includes five appendices, two of which are data recording forms for radiology and endoscopy. The other appendices include a risk assessment checklist, a field kit checklist, and Statement of Health checklist.

UPCOMING CONFERENCES

Rachel S. Popelka-Filcoff, Associate Editor

2010

30 November-2 December. IGCP 588: 'Preparing for Coastal Change' and INQUA 1001: 'Quaternary Coastal Change and Records of Extreme Marine Inundation on Coastal Environments' Hong Kong, China. Contact information: Dr. Y Zong: igcp588@hku.hk

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

9-13 December. Australian Archaeological Association Annual Conference, Australian National University, Canberra, ACT, Australia. http://arts.anu.edu.au/AandA/archaeology/aaaconference/aaaconferencehome.asp

13-17 December. AGU Fall Meeting, San Francisco, CA USA. http://www.agu.org/meetings/ Special session on Magnetism of Glassy Materials.

2011

5-9 January. Society for Historic Archaeology Conference on Historical and Underwater Archaeology, Austin, TX, USA. http://www.sha.org/

7-9 January. 113th Joint AIA/APA Annual Meeting. San Antonio, TX USA. http://www.archaeological.org/webinfo.php?page=10096

7-11 January. 5th International Biogeography Society Meeting, Crete. http://www.biogeography.org/html/Meetings/index.html

20-25 March. Twelfth International Conference on Accelerator Mass Spectrometry, Wellington, New Zealand at the Museum of New Zealand, Te Papa Tongarewa. http://www.gns.cri.nz/ams12/. Abstract deadline: 15 December 2010

27-31 March. 241st ACS National Meeting and Exposition, Anaheim, California, U.S.A. http://acs.org

13-18 March. Modern Trends in Activation Analysis, College Station, TX, U.S.A. Special session on Archaeometry. http://tti.tamu.edu/conferences/mtaa13/

13-18 March. Pittcon Conference and Expo, Atlanta, GA, USA. http://www.pittcon.org/

30 March- 3 April. Society for American Archaeology 76th Annual Meeting. Sacramento, CA USA. http://www.saa.org/meetings/index.html, Contact: meetings@saa.org

3-6 April. Qin Period Metallurgy and its Social and Archaeological Context. Xian, China. http://www.ucl.ac.uk/silva/archaeology/events/conference/qinmetallurgy2010

3-8 April. European Geosciences Union General Assembly 2011, Vienna, Austria. http://www.egu.eu/

10-15 April. 6th International Symposium on Radiocarbon and Archaeology. Pafos, Cyprus. http://c14.cyi.ac.cy/

11-15 April. Archéométrie 2011, Liege, Belgium. http://www.archeometrie2011.ulg.ac.be/Welcome.html Abstract deadline 15 November.

12-16 April. American Association of Physical Anthropologists Annual Meeting. Minneapolis, MN, USA. http://physanth.org/annmeet/

12-16 April. Paleoanthropology Society Meetings, held in conjunction with the American Association of Physical Anthropologists. Minneapolis. MN, USA. http://www.paleoanthro.org/meeting.htm

14-16 April. On the Surface: The Heritage of Mines and Mining. Innsbruck, Austria. http://tourism-culture.com/conferences_and_events.html

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

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

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

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

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

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

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

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

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

9-12 October. The Geological Society of America National Meeting. Minneapolis MN, USA "Archean to Anthropocene-the past is the key to the future". http://www.geosociety.org/meetings/

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

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

2012

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

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

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