# SAS BULLETIN

NEWSLETTER OF THE SOCIETY FOR ARCHAEOLOGICAL SCIENCES

VOLUME 36 NUMBER 1 SPRING 2013

[Ed. Note: This following report is the second from a young scholar who has received funding from the new Society for Archaeological Sciences Student Research International Travel Award. With the support of this grant, the author was able to travel to Sicily over the summer to conduct research he says is critical to the completion of his dissertation. Please consider sharing the information about this award with any researchers you know who might benefit from similar assistance. More details, including deadlines and eligibility, can be found at www.socarchsci.org/awards1.html.]

## OBSIDIAN CONSUMPTION AND LITHIC REDUCTION STRATEGIES IN PREHISTORIC SICILY (CA. 6TH-3RD MILLENNIA BC)

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*and winner of a recent SAS grant*

As part of my dissertation, I am exploring obsidian consumption on the island of Sicily by the last hunter-gathering communities of the Mesolithic (ca. 7th millennia BC), the first farming communities of the Neolithic (ca. 6000-3500 BC), and the early metal users of the Chalcolithic (3500-2500 BC). By combining portable X-ray fluorescence (pXRF) spectrometry with techno-typological characterization, I examine the distribution of obsidian from the island sources of Lipari and Pantelleria. Moreover, these results are contextualized within broader archaeological patterns of obsidian reduction and use.

Previous studies have shown that Lipari is the primary obsidian source exploited by Neolithic peoples of southern Italy and Sicily, with Pantelleria material being found in assemblages in western Sicily. Nevertheless, these interpretations are based on the study of a relatively small number of total artifacts, and there is not a clear understanding of the spatial and temporal differences that exist regarding how obsidian was procured, reduced, and consequently used. Indeed, it is critical to understand the interrelations between all of the various stages of obsidian consumption, not just procurement, to fully appreciate how obsidian was integrated into the lives of the people who used it (see Freund, in press for a more in-depth discussion). To address these issues, I traveled to two museums in Sicily to analyze their obsidian collections.

My summer began in Syracuse, Sicily where I began a joint venture with Professor Robert Tykot studying obsidian assemblages housed at the Paolo Orsi Regional Archeological Museum in Syracuse and the Regional Archaeological Museum of Milena in Milena, Sicily. We used a Bruker Tracer III-V pXRF machine to source the

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artifacts from both museums. To begin, the artifacts were cleaned with water to remove any dirt or other contaminates that could affect the results of our chemical analysis. A filter was placed directly into the machine that enhanced results for certain trace elements (Rb, Sr, Y, Zr, Nb) already shown to be successful for West Mediterranean obsidian sourcing. The artifacts were placed on the top of the machine and analyzed for a period of two minutes. While the immediate display on the computer screen showed obvious differences between samples, the raw analytical data were calibrated against standard reference materials to determine the actual concentrations. These results were ultimately compared with known geological samples.

In addition to elemental sourcing, each artifact was analyzed techno-typologically. This included recording the length, width, thickness, and percentage of cortex on all of the artifacts as well as dividing them into categories, including: nodules, cores, flakes, blades, and angular waste. This typology was created in order to classify artifacts into their various stages of reduction, thus allowing for the recognition of the various forms in which obsidian entered a particular site and how it was consequently reduced.

Our initial results indicate that blades were the primary artifact type created with both Lipari and Pantelleria material during the Middle to Late Neolithic (ca. 5000-3500 BC) (See Figure 1). Despite island-wide similarities in lithic reduction strategies, there appear to be distinct differences in how obsidian from the various sources was obtained. It is argued that Pantelleria material was acquired directly and unsystematically by travelers sailing between Pantelleria and Sicily. In the case of Lipari, it is likely that more formal exchange networks were in place for the distribution of preformed cores. These results will be discussed in more detail in a soon to be published paper.

This study is an initial step towards a more comprehensive understanding of the nature of obsidian exploitation in Sicily and a more thorough comprehension of how obsidian was distributed from Lipari and Pantelleria through time and space. This upcoming summer, I plan to supplement this work through the analysis of additional artifacts from more diverse archaeological contexts in order to develop richer interpretations that can reveal patterns not readily apparent in much of the previously analyzed data.

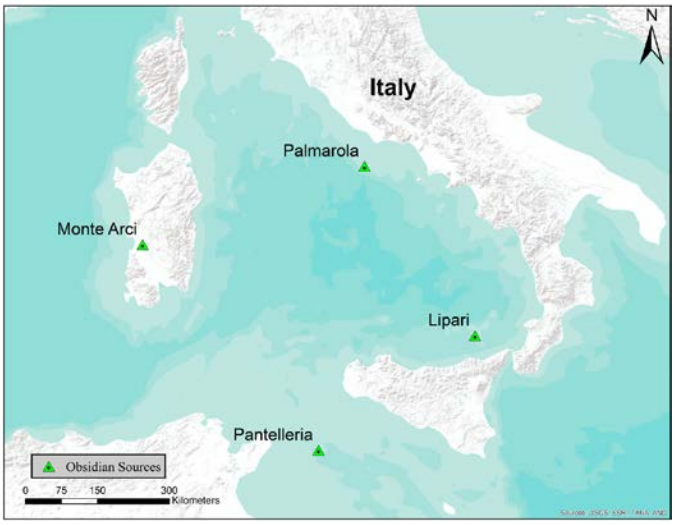


*Figure 1. Map of the region of the Mediterranean Sea containing Southern Italy, Scilily, Sardina, and Northern Tunesia.*

I am grateful for the support of SAS and I hope that my continued research will provide results that are engaging not only to West Mediterranean scholars, but also to all those interested in how material objects shape the human experience.

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## Extracting New Information from Old Experiments: GC/MS Analysis of Organic Residues in Aged Experimental Grinding Tools

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**Introduction**

For several decades, gas chromatography-mass spectrometry (GC/MS) of lipids and other organic compounds extracted from ancient pottery has helped to identify the use, transport, and processing of various foods and resins in prehistory (Condamin et al. 1976; Eerkens 2002; Evershed et al. 1999, 2009; Patrick 1985). Although lipid analysis has rarely been applied to ground stone artifacts, limited testing has recovered lipids from

the grinding surfaces of some ancient milling tools in quantities that fall within the range of those typically extracted from pottery (Buonasera 2005, 2007, 2012; Burton 2003). However, little experimental research has explored the taphonomy of lipid residues in ground stone. As one small step towards this end, this study extracted and analyzed samples of experimental grinding tools that were last used between 17 to 22 years ago.

Some experimentation on trajectories of fatty acid degradation in pottery sherds has been conducted. One set of experiments used elevated temperature to speed oxidation (Malainey 1999). Another involved burying several pottery sherds in different soil types, or leaving them in the open for up to one year (Reber 2001). Here, the preservation of lipids in ground stone tools exposed to dry, open-air, and sheltered conditions was explored by extracting and analyzing samples from several curated experimental grinding tools. Each tool was used to grind a single, known substance approximately 20 years ago. Given that autoxidation in the presence of atmospheric oxygen and photoxidation induced by strong light are primary mechanisms of fatty acid degradation (Christie 1989:30; Passi et al. 1993; Rastrelli et al. 2002), these experimental tools can provide useful information about lipid degradation in archaeological ground stone materials—particularly those situated in dry, open environments.

**Research Objectives**

1. To investigate how, and how quickly, lipids in ground stone tool surfaces degrade in a dry, open environment
2. To see whether methods (fatty acid ratios and biomarker techniques) commonly used to identify lipid sources in pottery sherds could be useful for identifying organic residues in ground stone tools from dry, open-air, sheltered contexts
3. To help determine effective sampling techniques and sizes for lipid analysis of ground stone tools

**Methods**

The grinding tools were originally made to compare patterns of use-wear (Adams 1989; O'Brian 1994). Since this time they have been stored on a shelf, exposed to the air and light and to occasional handling as reference materials for use-wear patterns. The total amount of time each tool was used for grinding, the length of time since they were last used, and the substances they were used to process are reported in Table 1.

*Table 1. Sample data and total fatty acid concentration*

| Substance processed | Grinding time (hrs.) | Age of residue (years) | Sample wt (g) | Total FAME (µg/g) |
|---|---|---|---|---|
| clay | 10.8 | 19 | 0.536 | 13 |
| sunflower seed | 2.3 | 22 | 0.297 | 696 |
| crickets | 4.0 | 17 | 0.477 | 37 |
| chokecherries | 28.0 | 17 | 0.523 | 458 |
| dried meat[a] | 4.5 | 17 | 0.423 | 119 |

[a.] Several types of dried meat were ground, primarily beef, but also elk, lamb, and turkey (O'Brien 1994).

Samples (approximately 1 cm in diameter by 0.5 cm deep) were removed from experimental grinding tools with an electric drill fitted with a solvent cleaned, diamond–embedded core bit (Figure 1). Sample cores were then wrapped in aluminum foil and placed in plastic bags until analyzed. Just prior to extraction, sample cores were ground with a solvent cleaned laboratory mortar and pestle (Figure 2). Samples were extracted and analyzed via GC/MS at the IIRMES laboratory at CSU, Long Beach. Ground samples (ranging from 0.5 to 1.3 g) were extracted using a microwave assisted method (Gregg and Slater 2010). To facilitate analysis via GC/MS, lipids were transesterified to fatty acid methyl esters (FAMEs) with 3 ml of 3N hydrochloric acid in methanol at 60C, 30 min. Derivatized lipid extracts were raised in chloroform and stored at -20C. All steps involving solvent removal and lipid concentration were performed under nitrogen. Stringent cleaning protocols were observed and a sample blank was prepared and analyzed along with the samples. Lipids were analyzed on an Agilent 6890 GC and HP 5973 MSD (EI, 70 eV). A 2 µL aliquot of each derivatized sample was injected (splitless) onto a DB-5 column (60 m x 0.25 mm i.d.). Peaks were integrated and analyzed with the aid of HP Chemstation software.

*Figure 1. Sampling experimental grinding tools with a portable drill fitted with diamond-embedded, solvent cleaned, core bit*

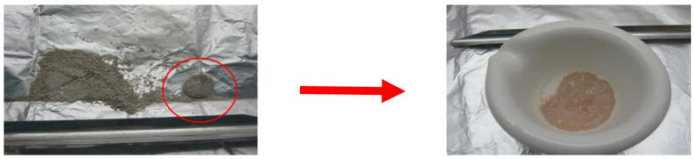

*Figure 2. A sample core ground in laboratory mortar prior to extraction*

Identifications were based on comparison to the NIST mass spectral database and by comparison to retention times and mass spectra of known fatty acid standards (Supelco 37, Supelco). A known amount of internal standard (C19:0, Restek) was placed in an archaeological sample that was run on the same column, on the same day, under the same parameters. The response (measured in area counts) from this was used to calculate fatty acid quantities (as FAMES—fatty acid methyl esters) in all experimental samples.

**Results and Conclusions**

Sampling techniques and sizes worked well for the analysis. Measurable amounts of fatty acids and other lipids were detected in all samples (Tables1 and 2). The amount of fatty acids recovered from tools used to grind clay and insects were many times lower than those recovered from meat, chokecherry, and sunflower residues (Table 1). The clay residue was the only residue to contain more than trace quantities of alkanes. These sampling techniques have since been successfully applied in the field, testing archaeological grinding features in dry caves at Gila Cliff Dwellings National Monument (Buonasera 2012).

After 17 to 22 years of exposure to oxygen and light, unsaturated fatty acids were highly degraded. Most of the unsaturated fatty acids had degraded into dicarboxylic acids and shorter chain fatty acids (Figure 3). In fact, dicarboxylic acids were the most abundant lipids remaining in the tools. This is consistent with research on the oxidation of fatty acids and other lipids in food oils showing autoxidation to be a major mechanism of lipid degradation (Passi et al. 1993; Rastrelli et al. 2002).

It also implies that ground stone artifacts that are not protected from oxygen and sunlight when they enter the archaeological record should contain little to no detectable *unsaturated* fatty acids from prehistoric grinding activities. However, ratios of some common *saturated* fatty acids could still be useful for making gross generalizations about the overall (e.g., plant versus animal) character of an organic residue.

*Table 2. Relative amounts of fatty acids recovered from aged experimental ground stone tools used to process several different substances (all rows sum to 100)*

| Aged samples | c8:0 | c9:0 | c10:0 | c11:0 | c12:0 |
|---|---|---|---|---|---|
| clay | 0.2 | 1.9 | 2.5 | 1.6 | 14.7 |
| meat[a] | 0.0 | 0.2 | 0.4 | 0.6 | 0.8 |
| crickets | 0.0 | 0.3 | 0.4 | 0.0 | 2.7 |
| chokecherry | 2.5 | 18.2 | 8.1 | 0.0 | 2.7 |
| sunflower | 1.0 | 1.1 | 0.4 | 0.0 | 1.1 |

| Aged samples | c13:0 | c14:0 | c15:0 | c16:1 | c16:0 |
|---|---|---|---|---|---|
| clay | 2.2 | 20.7 | 2.3 | 0.0 | 41.1 |
| meat[a] | 0.2 | 8.6 | 1.6 | 0.0 | 57.2 |
| crickets | 0.0 | 4.1 | 0.6 | 0.0 | 70.6 |
| chokecherry | 0.0 | 3.2 | 1.6 | 0.4 | 48.1 |
| sunflower | 0.0 | 1.4 | 0.6 | 0.0 | 55.3 |

| Aged samples | c17:0 | c18:3 | c18:2 | c18:1 | c18:0 |
|---|---|---|---|---|---|
| clay | 0.9 | 0.0 | 0.0 | 0.0 | 12.0 |
| meat[a] | 0.8 | 0.0 | 0.0 | 1.6 | 27.8 |
| crickets | 0.0 | 0.0 | 0.0 | 7.6 | 13.8 |
| chokecherry | 1.4 | 0.0 | 0.0 | 0.7 | 12.6 |
| sunflower | 0.9 | 0.0 | 0.0 | 2.0 | 32.0 |

| Aged samples | c20:1 | c20:0 | c21:0 | c22:0 | c24:0 |
|---|---|---|---|---|---|
| clay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| meat[a] | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| crickets | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| chokecherry | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 |
| sunflower | 0.0 | 1.3 | 0.0 | 2.7 | 0.3 |

[a.] Several types of dried meat were ground, primarily beef, but also elk, lamb, and turkey (O'Brien 1994).

This research found that a combination of saturated fatty acid ratios 12:0 to 14:0 and 16:0 to 18:0 as presented in Eerkens (2005) were better able to distinguish between degraded plant and animal residues than 16:0 to 18:0 alone (Tables 3 and 4). The shorter saturated fatty acids 12:0 and 14:0 are more water-soluble than 16:0 and 18:0, however, and are less likely to remain in buried contexts where artifacts are exposed to water moving through the soil. Their preservation may be more reliable in drier settings, especially those with added protection from rain and direct sunlight such as dry rock shelters or caves. In such settings, more water-soluble degradation products like diacids, short chain fatty acids, and hydroxy fatty acids could also provide useful information for identification (Passi et al. 1993, Hansel and Evershed 2009; Buonasera 2012).

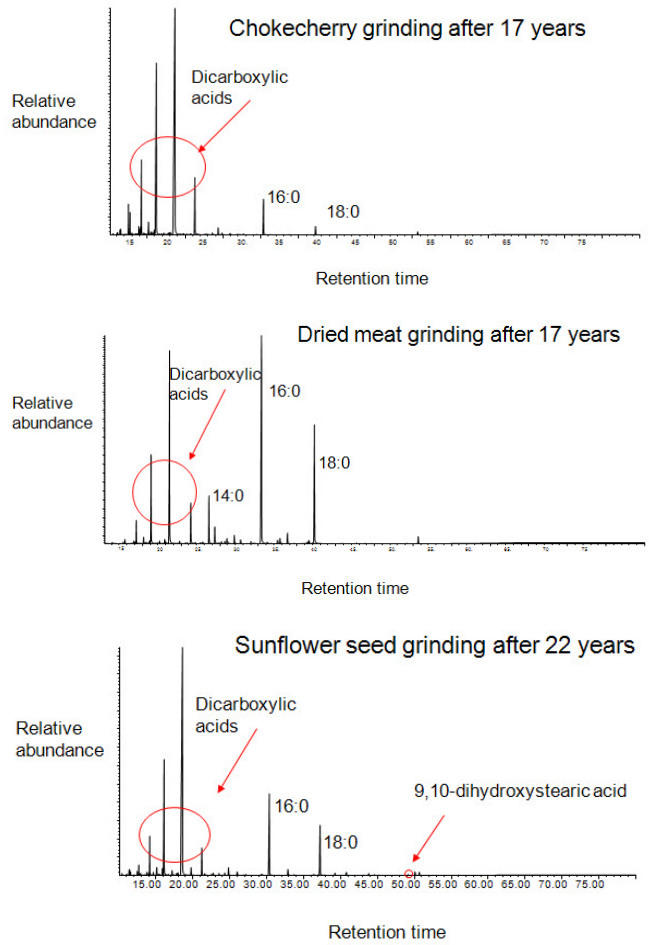


*Figure 3. Total ion chromatograms of aged experimental residues*

*Table 3. Ratios and other lipids in aged samples*

| Aged samples | Ratio of C12:0/C14:0 | Ratio of C16:0/C18:0 | Other Lipids |
|---|---|---|---|
| clay | 0.71 | 3.43 | Alkanes |
| meat | 0.09 | 2.06 | |
| crickets | 0.66 | 5.12 | |
| chokecherry | 0.84 | 3.82 | |
| sunflower | 0.79 | 1.73 | 9,10-dihydroxy-octadecanoic acid |

*Table 4. Identifications based on different saturated fatty acid ratios*

| Sample | 16:0/18:0 and 12:0/14:0 Eerkens (2005) | 16:0/18:0 Reber and Evershed (2006) |
|---|---|---|
| clay | seed | plant |
| sunflower | seed | plant |
| cricket | seed/berry | plant |
| chokecherries | seed/berry | plant |
| meat | terrestrial herbivore | plant |

For a variety of reasons, fatty acid ratios can give erroneous identifications when used as a sole source of identification (Buonasera 2007; Evershed 1993; Reber and Evershed 2006). Nevertheless, they frequently play a role in multipronged identification schemes. Depending on the application, fatty acid ratios might be used in conjunction with compound specific stable isotope analysis (CSIA) and/ or with specific biomarkers. Further experimental testing of their degradation trajectories in archaeological materials under different environmental conditions could be useful and should be conducted.

Finally, this study also identified 9,10-dihydroxy-octadecanoic acid (9,10-dihydroxystearic acid) in the degraded sunflower residue. Although this compound has been identified as a product of oleic acid (18:1) degradation, particularly in oils subjected to high heat from burning or cooking (Coply et al. 2005; Hansel and Evershed 2009), it may represent a biomarker of sorts in the present context. Compositeae seeds are known to contain some unusual, oxygenated fatty acids, in particular 9,10-epoxy-octadecanoic acid (Badami and Patil 1981), which has been shown to degrade into 9,10-dihydroxy-octadecanoic acid (Mikolajczak et al. 1968). Furthermore, despite also containing high amounts of oleic acid prior to their advanced state of degradation, neither the aged chokecherry nor the meat residue contained any dihydroxy fatty acids (see Malainey 1997:271 and Wilson 2007 for fatty acid profiles of the fresh substances).

Results of this limited testing have shown that abundant lipids from grinding activities are preserved in the surface of ground stone tools after approximately 20 years, and that those lipids can still provide some information useful for identifying their sources. Small cores (1 cm x 0.5 cm deep) were more than adequate for detecting and identifying absorbed lipids in grinding surfaces. This research is especially applicable to ground stone materials from dry, open-air, sheltered contexts such as dry caves or rock shelters. Additional long-term experiments are needed to address preservation in buried contexts and under different environmental conditions.

**Acknowledgements**

Thanks to Jenny Adams for encouraging this research and for allowing holes to be drilled in some of her reference materials. Laboratory work was performed at the IIRMES laboratory at CSU, Long Beach during the summer of 2010. This research was greatly aided by a NSF funded visiting researcher program at that institution (grant BCS-0917702). I am thankful for the help and support of Hector Neff, Richard Gossett, and IIRMES staff.

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## ARCHAEOLGICAL CERAMICS

*Charles C. Kolb, Associate Editor*

This issue contains four topics: 1) Book Reviews; 2) Previous Meetings; 3) Forthcoming Meetings; and 4) Field School.

**Book Reviews**

***The Symposium in Context: Pottery from a Late Archaic House Near the Classical Athenian Agora*** by Kathleen M. Lynch. Princeton, NJ: American School of Classical Studies at Athens 2011. xxi + 377 pp., 14 color and 193 black-and-white figures, 15 tables, 3 appendices, references, index. ISBN-13: 978-0-87661-546-1, ISBN-10: 0-87661-546-9 (paperback), US $75.00. David Brown Book Company offers the volume for $60.00.

While excavating a Roman temple situated at the north extension of the Athenian Agora, excavators found the remains of a Late Archaic period house and a courtyard in which a well (J 2:4) with a fieldstone lining had been cut to a depth of 5.8 m into soft bedrock. Excavation of this well, which proved to have six distinct levels, was undertaken from 1993 to 1995 and provided the basis for Lynch's dissertation, *Pottery from a Late Archaic Athenian House in Context* (University of Virginia, 1999). This deposit contained utilitarian and fine-ware pottery, nearly all the figured pieces of which are forms associated with communal drinking. (A symposium is a Classical Greek men's communal drinking party.) The house and well are related to 479 BCE, the time of the cleanup phase after the Persian destruction of Athens.

"Chapter 1: Introduction" (pp. 1-3) provides background information and in the subsequent chapter Lynch characterizes "The Archaeological Context of Well J 2:4" (pp. 5-8, 15 figures, 2 tables) which contained Red-figured and Black-figured ceramics (12 and 23 different vessel forms, respectively, reviewed by types and functions). "Chapter 3: Quantifying the Household Assemblage" (pp. 49-73, 18 figures). Fortunately, all excavated material from the well was retained (nothing was discarded) and there were 233 inventoried objects and 48 "tins of context pottery." Within the six levels she compared fine wares, household ceramics, cooking wares, storage vessels, ritual pottery, personal vessels, and pottery lamps, weaving tools, and miscellaneous and uncertain artifacts as well as ceramic building materials. Table 4 presents data by level while Table 5 provides information on the minima and maxima of numbers of vessels recovered from the well. The most common drinking vessel was the cup (*kylix*) and cup-*skyphos*.
"Chapter 4: The Sympotic Context Part I: Drinking Vessels" (pp. 75-123, 15 color figures, 3 tables). Red-figured, Coral Red, and Black-figured wine cups and Heron class *skyphoi* are documented in color illustrations. Six illustrations are of misfired objects recovered from the well. "Chapter 5: The Sympotic Context Part II: Service Vessels" (pp. 125-146). The ceramics included wine storage, water storage, wine mixing vessels, sympotic table wares (*lekythoi*, *opai*, stemmed dishes, and a stand and disk), as well as lamps. The images on the vessels are unconventional and humorous – Lynch says "funny" -- rather than serious depictions of mythological tales or scenes of the gods. "Chapter 6: Household Activities Other than the Symposium" (pp. 147-166). The author also discusses other ceramics in the contexts of everyday dining habits, household chores (fetching water, food preparation, and weaving) and storage (jugs and transport amphoras), toilet items, toys, and household ritual objects (votives). "Chapter 7: Conclusions and Contexts" (pp. 167-175, 1 table) emphasized the "context of use" and reviews archaeological, household and social contexts. She notes that "pottery can be a barometer for more than just chronology" (p. 175).

The "Catalogue" (pp. 177-293, 164 figures). Individual artifact entries include catalogue number, Athenian Agora inventory number, measurements, descriptions, comparanda, and chronology. "Appendix I: Transport Amphoras from Well J 2:4" by Mark L. Lawall (pp. 295-326, 27 figures, 7 tables) is a summary of amphora types from the well and a catalogue of amphora finds with graffiti, as well as comparisons with other Late Archaic and Early Classical contexts. "Appendix II: Volume Studies" (p. 327) has data on 26 complete or nearly complete vessels. "Appendix III: The Foot in the Well with Osteological Identification" by Lisa M. Little (pp. 329-331, 1 figure) documents human skeletal remains, notably portions of a human left foot. The volume concludes with a list of 614 "References" (pp. 333-349), a "General Index" (pp. 351-368) of conflated topics and proper nouns, "Index of Catalogued Objects" (pp. 369-374), "Index of Deposits" (pp. 375-376), and "Index of BZ Context Lots" (p. 377).

This monograph is a revision of the dissertation and presents information on the first well preserved set of sympotic pottery recovered from an Athenian domestic setting. The archaeological context allowed the iconography of the figured wares to be associated with a specifically Athenian worldview, in contrast to Attic

figured pottery made for export markets. Since it comes from a single house, the pottery reflects the purchasing patterns and thematic preferences of the homeowner. A multifaceted approach was adopted to illustrate that meaning and use are inherently related, and that through archaeology it is possible to restore a context of use for a class of objects usually studied in isolation.

***Sogdian Pottery of the 5th-7th Centuries as Historical and Cultural Phenomenon (On the Methods of the Study of Ceramic Complexes)***, Boris I. Marshak, St. Petersburg: The State Hermitage Publishers, 2012. 384 pp., 172 illustrations, ISBN 978-5-93572-454-2, no price given (hardback). (In Russian). Керамика Согда V-VII веков как историко-культурный памятник (К методике изучения керамических комплексов), Б.И. Маршак, СПб: Изд-во Гос. Эрмитажа.

Boris Illich Marshak was born July 9, 1933 in Luga, Leningrad Oblast, Russian SFSR. He received a MA in archaeology from Moscow University in 1956, a Ph.D. in archaeology from the Institute of Archaeology, Leningrad in 1965, and a second doctorate from Moscow University in historical sciences in 1982. This monograph grew out of his unpublished dissertation written in 1958-1964 and defended in 1965 and was based on research conducted at the archaeological site of Penjikent in 1955-1963. (Penjikent is also spelled Panjikent, especially in the *Encyclopedia Iranica*; Marshak wrote the article "Panjikent" for that work in 2002 but prefers the former spelling.) Some of the chapters from his dissertation were previously published as articles; he wrote more than 200 scholarly papers and eight books during his career. He spent more than five decades excavating and studying at Penjikent and most of the narrative of his volume on Sogdian ceramics was edited by Marshak himself in the summer of 2004 and the manuscript prepared for publication by his widow, Valentina I. Raspopova, also an archaeologist who excavated residential quarters at the site. He died July 28, 2006 at the excavation of ancient Penjikent and, as requested in his will, was buried near the ramparts of the citadel.

This volume focuses on Marshak's meticulous analysis of Sogdian ceramics from the 5th to 7th centuries CE. In the main, the monograph emphasizes the pottery from the lower levels at Penjikent and other sites excavated by Marshak primarily from 1955 through 1963. The author has revised his dissertation, taking into consideration his many years of experience and reanalysis which has led to the reevaluation of a number of conclusions postulated in 1965. Nonetheless, his methodology and general conclusions have not lost their significance during the past fifty years because "Penjikent remains a model early medieval city" and because he applied statistical methods, typical of processual archaeology in the 1950s-1960s, to his solutions of historical and cultural problems, rather than purely descriptive accounts. The present work is an attempt to solve such problems on the basis of a wide range of materials from only one site, Penjikent, the easternmost Sogdian settlement, initially a small but flourishing walled town in pre-Islamic Central Asia which was the capital of Panch, also known as Panchekanth. The ethnic and territorial name "Soghd/Soghdian" or Sughd/Sughdian was mentioned as early as the Iranian Achaemenid Dynasty (6th century BCE). The town grew into a small city by the 5th century CE and many professionals such as merchants and businessmen made their livelihoods there. In 722 CE, Arabian forces besieged and annexed the town. The ruins of the ancient city are located on the southern periphery of the present-day city of Penjikent in western Tajikistan.

The excavation provided well-stratified materials, correlating with individual generations, rather than centuries, allowing Marshak to interpret and determine individual craftsmen and their customers. When possible, changes are accounted for by immanent causes; analogy is used only when cause-and-consequence explanations are not possible. He devised methods of excavating through a complex stratigraphy and employed statistical methods in processing the ceramic materials so that he reports on the history of the settlements (primarily Penjikent) as well as the evolution of ceramic technology and styles, and on the history of economy and culture of Sogdian society. The monograph refers to only a few works published after 1965, because his conclusions are "based on materials which are both varied and variable, so that explanatory power of analogizing is negligible" (p. 382).

"The Principle of the Study" (pp. 9-11) provides salient background while "Chapter I: The Stratigraphy of the Lower Layers at Penjikent, 1955-1960" (pp. 13-56) documents excavation methods at Site XII, and four periods of construction: a first period followed by the destruction of the original construction, a second period of building (including Buildings 16, 18, 19, 2, 7, 8, 13, and 14), a period of restructuring, a third period of construction, repairs to earlier structures, and landfilling prior to the fourth period of building. The present work is an attempt to solve such problems on the basis of a wide range of materials from only one site, the Sogdian city of Penjikent. These well stratified materials, correlating with individual generations, rather than centuries, allow one to come closer to individual craftsmen and their customers. Where possible, the changes are accounted for by

immanent causes; analogy is used only when cause-and-effect ("consequence") explanations are not possible.

"Chapter II: Ceramics of the Lower Layers at Penjikent" (pp. 58-181) details the pottery groups, vessel profile measurements, vessel forms, and decorations -- particularly painting. There is a valuable discussion of the changing proportions of bowls, jars, and "wide-vessels," bowl classification and the evolution of rim forms and decoration, the classification of jugs and pitchers, and the emergence of new common and specialized forms in the assemblage of pitchers. Jugs and pitchers are discussed in detail and the chapter also documents mugs, simple and ceremonial jars, amphora, "table jugs," and rhytons. The latter part of the chapter focuses on wide vessels (basins), rare forms of ceramic utensils, molded pots, boilers, and pans. Marshak considers the absolute dating of Complex VI, presents additional studies on the dating of the second building period (Complexes III-V / 3), and summarizes the major findings from the stratigraphy and ceramics at Penjikent. The topics of local pottery production, storage vessels and tableware manufacture, and probable "production to order" are also reviewed – perhaps too briefly.
"Chapter III: The Lower Layers of Ceramics and Penjikent Sogdiana in the V-VI Centuries" (pp. 182-204) provides the reader with an analysis of relations between geographic areas within Sogdiana and the variations in ceramics. He details the chronology, compares temporal and local variants, and assesses similarities and differences among the ceramic assemblages. The principles of pottery classification used in his monograph are not always simple or obvious. The most significant of these result from a comparison of different groups of vessels from both synchronic and diachronic perspectives.

"Chapter IV: Sogdian Pottery from the End of the VII to the Beginning of the VIII Century" (pp. 206-246) begins with a discussion of transitions of Sogdian pottery styles during the VII century, and he also relates political events and the monetary system. There is a general presentation on the potters' quarter at Kafyrov-kala and technical innovations in the VII century ceramics at Kafyrov-kala. Among the vessel types detailed are: bowls, three types of earthenware mugs, pitchers, small jugs, and "rare" forms of pottery. Types of decoration including stamped designs are reviewed. Marshak also characterizes dining room ceramics, stylistic changes, and economic transformations and views the VII-VIII centuries as a transitional stage in the history of early medieval pottery. From the second half of VII century to the beginning of the VIII century, a new style of pottery was produced so that earthenware vessels had to remind the consumer of metal forms to show as Marshak states the "metallicity." Household dishes continued to evolve towards further standardization and distinctive forms. There is a brief "Conclusion," 172 illustrations (clustered pp. 251-366), "References" (pp. 368-379), and "List of Abbreviations."

Readers may find his presentation rather "old fashioned" in that there are no physicochemical analyses of the ceramics, that ceramic relative chronology is the primary dating technique, and that the narrative has not been substantially updated since the mid-1960s reflecting the methods and theories of that era. Russian archaeologists working in Central Asia rarely employ these scientific methods; German and Spanish archaeologists use INAA and at least one American researcher (your reviewer) use petrographic thin section analysis. This is an interesting and remarkable volume and a tribute to the dedication of one diligent researcher who developed meticulous excavation techniques to work in complex, well-stratified contexts which he is able to correlate with *individual generations*, allowing him, as he writes, *to come closer to individual craftsmen and their customers*.

***The Pottery from the Early Medieval Trading Site and Cemetery at Groß Strömkendorf, Lkr. Nordwestmecklenberg*** by Torbjörn Brorsson, Römishg-Germanische Komission des Deutschen Archäologischen Instituts, Frankfurt A. M. Frühmittelalterliche Archäologie zwischen Ostsee und Mittelmeer, Band 1. Wiesbaden: Reichert Verlag, 2010. x + 157 pp., 54 black-and-white, and 14 color illustrations, 23 tables. ISBN-13: 978-3-89500-751-4, ISBN-10: 3-89500-751-X, € 30.70/$50.00 (hardcover).

The author obtained his Master of Science at Lund University in 1996. In 2005 Brorsson became Doktor der Naturwissenschaft at Kiel University. He is also the author of *ICP analyses of ceramics from Scandinavia and from Kolkuós in Iceland*, Ceramic Studies, Sweden, Vadensjövägen 150, SE-261, 91 Landskrona, Sweden, 2009; online at: torbjorn.brorsson@ceramicstudies.se www.ceramicstudies.se . The monograph under review is a version of his doctoral thesis supervised by Anders Lindahl; a free copy of is available online at: http://www.geol.lu.se/kfl/Sidor/Publications/monographs.htm There are 11 chapters in this "archaeological study involving natural sciences analyses of the ceramic find material" from the early medieval trading site Gross Strömkendorf at Wismar, Nordwestmecklenburg. Excavations between 1990 and 1999 revealed a settlement and cemetery, the latter with "some relatively complete vessels," which had been used mainly as burial urns. Imported ceramics derive, in the main, from Scandinavia and the coastal region of the North Sea, but a

large amount of pottery also came from the Rhineland and the Eifel. A small amount of Saxon ceramics suggests that Saxons also visited this trading place.

In the "Introduction" (pp. 3-4), the author discusses the site context and chronology and trade contacts. During the 8th and early 9th century (Early Medieval period) the site was within the territory controlled by the Slavonic Obdorites. Slavs, Scandinavians and Saxons used the place as a trading center, and the site was *most likely* identical to the multiethnic emporium Reric on the south coast of the Baltic Sea mentioned in *Frankish Annales*: *Royal Carolinian Annals* dated 808 A.D. The complex political background of the region and Slavic expansion are documented in "Historical Background and Archaeological Evidence at Groß Strömkendorf (pp. 5-11). The archaeological remains consist of 104 pithouses, 1,000+ features, 62,355 potsherds, and a cemetery with ca. 250 graves illustrating a variety of burial customs (inhumation with and without ceramic vessels, cremation pits, and boat graves). Local craft activities included work in pottery, antler and bone, glass, amber, textiles, and metals.

Brorsson's "Methods" (pp. 13-16) of ceramic analysis follow E. Schuldt's system, "Die Slawische Keramik in Meklenburg," *Schr. Sektion Vor- u, Früghesche* 5 (1973) and B. Hulthén's "On Documentation of Pottery," *Acta Arch Ludensia Ser. in 8°, Minore* 3 (1974), as well as T. Kempke's rim analysis *Frühmittelalterliche Keramik au Oldenberg in Holstein* (1981) and D. Meier's characterization of decoration (1990). The scientific methods employed are, in the main, the analysis of 177 thin sections using polarized microscopy (25 and 630x) to discern grain size distributions and differentiation of natural inclusions and added temper. Refiring and sintering tests were also conducted and vessel shape analysis detailed. More than a dozen previous research studies are reviewed in "History of the Research of Ceramics" (pp. 17-22). The fifth chapter, "Early Medieval Pottery Types in the Baltic Region" (pp. 23-38) characterizes five pottery groups: Slavonic (including Sukow, Feldberg, and Fresendorf); Scandinavia; Lagoda; Curonian; and West-European (including Saxon, Muschelgris, Frisian Coarse Ware (shell tempered and sand tempered), Vorgebirge-Eifel, Badorf, Walberg, Mergvingian Black Ware, Mayen, and Tating).

In "The Pottery from Groß Strömkendorf" (pp. 39-54), he provides ceramic classifications by counts (62,355 sherds) and weights, and was able to classify 7.2% (8,440) sherds into a total of 20 types plus 53,912 sherds in a category called "Coarse-hand-made" ceramics. Slavonic related sherds accounted for most of the classified ceramics: Slavonic 59.3%, Sukow 26.2%, and Feldberg 7.9%. The settlement of 104 pithouses produced 19,946 sherds "dendro-dated" into three phases: first half of the 8th century (northeast settlement with 15 pithouses and 14 wells), 760-780 (north settlement with 12 pithouses and 12 wells), and 780-811 (south settlement with 24 pithouses and 43 wells) plus a central area of uncertain date (42 pit houses and 20 wells). The cemetery has 4,651 classifiable sherds (including 55 complete vessels classified as a single sherd), of which 70% were Sukow found in both urn burials and mound graves.

Sherds from these settlement and cemetery contexts are further define into the groups discussed in Chapter 5. "Results of the Study of Pottery Decoration, Shape, and Vessel Size" (pp. 55-67) provides narrative, tables, and figures on decorated pottery (1,981 sherds, some with more than two decorations) with wavy and horizontal lines, combing, stamping, and sulphur pyrite inserted in the wet clay as a decoration. Also documented are: grain size variation (Tables 9-10), sherd temper and thickness (Tables 10-13), vessel height (Tables 14-15), rim diameters (Tables 16-17, based on ca. 7,000 specimens), rim shapes (Table 18), base types (Fig, 19, 4 forms), base diameter (Tables 19-20), and base thickness (Table 21). A total of 2,315 sherds had impressions on base bottoms acquired during the drying phase (sand n = 121, organic n = 82, and textile n = 6); 21 showed the use of a "turntable."

The "Results of the Scientific Analysis of the Pottery" (pp. 69-82) includes a shape analysis (n = 100 vessels with complete profiles (only 7 pots were unbroken) and definition of 12 shape groups, mostly Sukow (n = 64) and Feldberg (n = 20). The results of the petrographic microscopy of 177 thin sections documented 15 ware groups (color photomicrographs Figs, 43 and 44), all described in detail, differentiated into 6 with fine clays and 9 with medium-coarse clays; one local clay sample was assessed and had quartz, feldspar, and mica. Crushed rock is the dominant temper with sand, quartz sand, grog, crushed seashell, volcanic glass, and calciferous inclusions also appearing. The wheel-thrown specimens had homogeneous clay and temper mixes. Twenty-five sherds and one local clay were subjected to thermal analysis and divided into 10 groups; hand-made vessels were fired at temperatures <1000° C; Slavonic 750-900° C fired in pits and bonfire and Vogelbirge-Eifel region vessels fired at 1050-1200° C.

Chapter 9, "Ceramic Craft at Groß Strömkendorf" (pp. 83-90), has interpretations and conclusions. Brorsson points out that ceramic production at the site is "based on a craft tradition that was several thousand years old" and

that production was at the household level. There are discussions about each aspect of the pottery production; notably, the major change in the craft was the introduction of the turntable. The main clays were non-calcareous with other clays containing mica of varying amounts. Coiling and modeling were typical in Baltic and North Sea regional ceramics but with wheel-throwing dominant in pottery from the Vogelbirge-Eifel region. Decorative elements are also further delineated. No kilns or pit firings can be identified at Groß Strömkendorf but two-chamber kilns are known from other chronologically contemporary sites. Cooking and storage were primary vessel functions and lipid and chemical analysis and radiography suggests contents mostly from vegetable products, but some animal lipids and evidence of fermentation. There is no evidence suggesting the local potters attempted to replicate imported pottery.

A question to ponder is: did different cultural groups use each other's pots? Cemetery evidence suggests that they did not. Fig. 50 (p. 88) provides data on 14 pottery types, 6 fabrication techniques, and "dendro-dates" in ten-year intervals from 720 to 810 CE. Trade contact apparently focused on western Denmark, while Saxon and Frisian influences were minimal. The author makes a strong case for "Groß Strömkendorf as a Trading Place in Northern Europe" (pp. 91-93) and believes that the groups living together were "quite integrated." He laments the lack of other sites with large quantities of pottery and the lack of "thorough ceramic analyses." In "General Results" (pp. 95-96) he discusses the answers to six questions posited in Chapter 2; there are also German-language (p. 97) and Russian (p. 98) translations.

Eight appendices (pp. 99-113): Appendix 1: Dendrochronology (pp. 99-100); Appendices 2-4 (Formulae p. 101); Appendix 5: Known Production Sites (p. 101); Appendix 6: Shape Analysis (pp. 102-103); Appendix 7: Thin Sections, n = 177 (pp. 104-108); and Appendix 8: List of Illustrations and Plates (pp. 109-113). The "Bibliography" (pp. 115-121) has 185 entries in English, Swedish, and German, and the 26 black-and-white Plates follow (pp. 123-148).

***A Corpus of Anglo-Saxon and Medieval Pottery from Lincoln,*** Jane Young and Alan Vince with Victoria Naylor, Lincoln Archaeological Studies 7, Oxford and Oakville, CT: Oxbow Books, 2005. xii + 293 pp., 96 figures, 15 color plates, bibliography, index, catalogue, 5 appendices, ISBN 10, 1-84217-083-X, ISBN-13: 978-1-84217-083-0, $63.00 (hardcopy).

In this monograph, the authors report on the post-Roman Anglo-Saxon and Medieval pottery found during 17 years of archaeological excavations (1970-1987) in the city of Lincoln, the center of a large pottery industry from the 9th to 15th centuries. Vince, a petrographer without peer, unexpectedly passed away in his 56th year in February 2009; see "Obituary: Alan G. Vince," *SAS Bulletin* 32(2):24-25 (2009).

In the initial chapter, "Introduction" (pp. 1-4), the authors present a city-wide pottery classification system and analyse the sequence of pottery types through time from 76 sites in the city. The volume is arranged by pottery types, illustrated by typical and unusual examples and accompanied by descriptions of their visual appearance, petrological characteristics, source, forms, decoration and dating evidence. Previous work was published by the late John Hurst in 1984. In "Chapter II: Methodology" (pp. 5-9, 1 figure), the authors discuss: 1) the quantification of data on 273,378 sherds by counts, EVS (Estimated Vessel Equivalents), and weight; 2) data presentation by periods (code names are listed in Appendix 1); 3) illustration standardization; 4) petrological analysis; 5) stratigraphy (Appendix 3); and 4) phasing (eight periods and dates, 450-1770 CE, from Anglo-Saxon to early Modern). The petrographic work was an "intensive analysis" to define clays (two basic types of clays: clay with little silt and clay with moderate to abundant silt. These silts were composed of quartz and minor amounts of muscovite, biotite, and accessory minerals. Four tempers were characterized: 1) coarse quartzose (chronologically the earliest, used in the 9th century); 2) shell limestone (disaggregated oyster shell, late 9th to early 11th century); 3) fine quartz sand with some sandstone and chert; and 4) iron-rich compounds. The only chemical analysis (INAA) was done by Fiona MacAlister (1984), *An Analysis of Lincoln Saxo-Norman Sandy and Gritty Wares, c. 1850-1175 A.D.*, unpublished Ph.D. dissertation, University of Durham. Since the publication of Young and Vince's work, Lyn Blackmore and Jacqueline Pearce have written *A Dated Type Series of London Medieval Pottery: Part 5, Shelly-sandy Ware and the Greyware Industries*, Monograph Series 49, London: Museum of London Archaeology, 2010); reviewed in *SAS Bulletin* 34(3):4-7 (2011).

The chapter "III: Dating" (pp. 10-26, 17 figures) has information on horizon codes and considers the issue of residuality from earlier to later (and later to earlier) ceramic assemblages; the chronologies used in this monograph are listed in "Appendix 2." The discussion on Horizons focuses on the main wares, "other" wares, imports, typological features, and dating evidence; the authors designate ASH 1 through ASH 14 (14 Anglo-

Saxon to Saxo-Norman horizons) and define MH 1 through MH 10 (10 early to late medieval horizons). PMH designates post-medieval horizons which are not in the scope of this study.

"IV: The Pottery (pp. 27-233) ten periods are defined and except for Roman, each is characterized by national context, Lincoln production, local production, regional imports, Continental imports, vessel forms, new forms, vessel types source, dating and frequency, and fabric and technology (including information on colors and inclusions). 1) Roman (only 3 sherds, p. 27); 2) Early Anglo-Saxon, c.450-c.650 (pp. 27-22, Figs. 27-32), n = 10 types; 3) Mid-Saxon, c.650-c.850 (pp. 33-41, Figs. 33-41), n = 12 types; 4) Late Saxon/Anglo-Scandinavian, c.850-c.1000 (pp. 33-41, Figs. 33-41), n = 33 types; 5) Saxo-Norman, c.1000-c.1120 (pp. 76-102, Figs, 70-92), n = 21 types; 6) Early Medieval, c.1120-c.1220 (pp. 102-132, Figs. 93-119), n = 30 types; 7) Medieval, c.1220-c.1350 (pp. 132-180, Figs. 120-155), n = 30 types and 12 imported wares; 8) Late Medieval, c.1350-c.1500 (pp. 180-230, Figs. 156-193), n = 24 types and 7 imported wares; 9) Early Post-Medieval, c. 1500-c.1600 (pp. 230-232), 2 local ceramic types from Lincoln, 10 Linconshire types, 3 regional import ceramic types , and 13 Continental wares; 10) Post-Medieval to Early Modern, ca. 1600-1770 (pp. 232=233,), no local Lincoln products, 9 Linconshire type, 13 regional import ceramic types, and 22 Continental imported wares.

"V: Discussion" (pp. 234-243, 1 figure). The authors reviewed the quality of the evidence from the sequence 5th through 19th century. The most detailed materials date 5th to 15th century and the earliest period c.450-c.850 is the weakest part of the typology. The 11th century has a large residual element from the 10th century and the evidence for the 12th century is variable. Most vessel types are similar to those from elsewhere in East Midlands, East Anglia, and South Yorkshire. There are a limited range of forms associated with the Anglo-Scandinavian/Late Saxon period. During the Early Medieval period, there were rapid changes in vessel form types and decorated jugs were high-status markers. All of the cooking pots during the 13th century were shell tempered but there were still a wide variety of minor pottery forms. Some new forms were copies of vessels previously made of wood or metal. By MH 10 at least 12 different types of jars were being produced and jugs remain a common element of ceramic assemblages. Drinking cups were also introduced in MH 10.

Pottery production in the community of Lincoln from the late 9th century onwards was confined to the eastern side of the settlement (prevailing winds would blow kiln smoke away from the villagers). The authors define two distinct phases of production: late 9th to early 11th century and mid-11th to 12th century. Connections between pottery and ceramic tile production are discussed and it is evident that Lincoln supported a large pottery industry from 9th to 11th centuries and decline began possibly because of competition from Torksey potters, but there was resurgence in the 12th century. Changes in clay resources and the end of the industry in late 12th to early 13th century are documented. Interestingly, some metalworkers are identified as "potters" in documentary sources of the era likely due to the casting of bells. Much work needs to be done outside of the city and the authors lament the lack of published material from five major loci, including Stamford and Nottingham.

The remainder of the volume is devoted to the catalog and appendices: "VI: The Pottery Catalogue" (pp. 244-274, 194 figures, Figs. 27-293). "VII: Appendix I: Pottery Codes and Horizon and Date Parameters" (pp. 273-275); 179 codes are listed. "VIII: Appendix 2: Ceramic Horizons and Dating Ranges" (p. 276); 36 are discussed. "IX: Appendix 3: Index to sites" (pp. 277-278, maps Figs. 2-3): 109 sites are listed. "X: Appendix 4: Closely-dated Ceramic Assemblages" (pp. 279); 21 are tabulated. "XI: Appendix 5: Summaries of Post-Roman Pottery" (pp. 280-282, 2 figures); authored by Jane Young. "XII: Bibliography" (pp. 283-287; 196 entries and three-column "Index" (pp. 289-292) with conflated proper nouns and topics. "XIII: Colour Plates" (15 plates with 77 images).

***Amsterdam Ceramics: A City's History and an Archaeological Ceramics Catalogue (1175-2011)***, Jerzy Gawronski (ed.). Stichting Promotie Archeologie, Amsterdam: Uitgeverij Bas Lubberhuizen/ Bureau Monumenten & Archeologie, 2011.335 pp., 529 black-and-white and 1,397 color illustrations, 2 appendices, bibliography. ISBN-10: 9059372670, ISBN-13: 978-9059372672, NUR 682/696, € 39,50/£51.20/$80.00 US (paperback). It is difficult to differentiate paperback edition prices from claims of hardcopy editions listed online, but there is no hardcopy version: http://www.lubberhuizen.nl/detail.php?id=490 This volume, published on 23 March 2012, is available for less at online sellers: $50.30 at Antiqbook and $64.00 at David Brown Book Company.

Jerzy Gawronski is the urban archaeologist for the city of Amsterdam (Bureau Monumenten & Archeologie, Amsterdam) and Professor of Maritime and Urban Archaeology of the Late Middle Ages and Early Modern Period, in particular of the city of Amsterdam, at the

University of Amsterdam. He points out that pottery is one of the most widespread artifacts found in Amsterdam, "before the advent of plastic anyway," and he is highly qualified to prepare this historical summary and survey of nine centuries of pottery in Amsterdam from 1175 until 2011. The catalogue features 1,247 ceramic objects and has ca. 200 color illustrations, providing the reader a representative range of objects from the tens of thousands of ceramic finds that have been excavated from ca. 213 sites in Amsterdam. The artifacts are presented in order according to material type and shape, providing an evocative and versatile impression of everyday domestic utensils used by Amsterdammers in their homes to eat and drink from, by the rich and by the poor, for display and for convenience, from local artisans or from foreign lands, from native-born residents and from newcomers, from 1175 to the present day.

In the initial essay, "The Urban History of Amsterdam" (pp. 8-15, 12 color illustrations, 2-page map of the city), Gawronski provides an historical overview of the city of Amsterdam and its growth, population, trade, politics, and culture using as a focus the "ceramic goods that once circulated within in the city." Excavations over the past 40 years have produced 50,000 kilos of potsherds and provided 10,000 complete or damaged items: everyday pottery, German stoneware, souvenirs, imports from Asia brought by the Dutch East India Company, and ceramics that Portuguese Jews brought from Lisbon. The Amsterdam map shows districts and islands, canals, bridges and locks, streets, gates and strongholds, and religious and public service buildings, as well as site excavations.

Nine subsequent chapters characterize the successive periods of topographical growth and shaping of the settlement in relation to political, religious, social and cultural factors of interest. This chronological order of the catalogue is based on the different stages of urban development of Amsterdam. Each chapter provides a map of the specific stage of urban development combined with a present day photo of the city area in question to illustrate the historical continuity of Amsterdam's urban structure. Each chapter begins with information on the size of the urban area and demographic information for the period. A summary of each chapter follows.

"1 Amsterdam 1175-1300" (pp. 16-25, 18 color and 4 b-w images): The oldest known building dates to 1175, and information provided on landscape changes, settlements, trade and artisanal products, churches, fortification and ceramics (family-made pots for cooking , serving, and storage). "2 Amsterdam 1300-1350" (pp. 26-31, 8 color and 2 b-w images): Neighborhoods, churches and chapels, the cloth and beer trades, city wall and defensive works, bridges, and seaport are documented; ceramic [production involved the use of imported clay. "3 Amsterdam 1350-1425" (pp. 32-41, 20 color and 5 b-w images): Urban growth, the city fire of 1421 defensive constructions, Baltic shipping (beer and cloth), guilds, religious fraternities, and monasteries are discussed; ceramics were both regional and local. "4 Amsterdam 1425-1500" (pp. 42-47, 11 color and 1 b-w images): Brick buildings were first constructed as were monasteries and harbor improvements; Mediterranean area ceramics first appeared. "5 Amsterdam 1500-1575" (pp. 43-55, 14 color and 2 b-w images): Urban development expanded beyond the city walls, and increased trade, Baltic and Atlantic shipping, the Anabaptist revolt (1535), and Dutch Revolt (1568-1648) are reviewed; ceramics reflected new styles brought about by the Renaissance.

"6 Amsterdam 1575-1625" (pp. 56-67, 21 color and 2 b-w images): An economic boom, the United East India Company (VOC), canal construction, and migrants are detailed; there was a notable shift in ceramics toward German Rhine imports. "7 Amsterdam 1625-1700" (pp. 68-79, 20 color and 2 b-w images): Commerce, the slave trade, public works, fortifications, bridges, and water management are documented; ceramics included primarily Westerwald wares, Chinese imports, and Delft ware products. "8 Amsterdam 1700-1850" (pp. 80-89, 19 color and 1 b-w images): A period of "stagnation and transition," industry, shipping, railroads and Protestantism are noted; ceramics include stoneware, Redwares, and porcelain. "9 Amsterdam 1850-2011" (pp. 90-101, 20 color and 1 b-w images) written by Vincent van Rossem. The modernization of the city, factories, railroads, urban expansion, post-World War II neighborhoods, and migrants are discussed; glass begins to replace pottery.

"Catalogue of Archaeological Ceramics from Amsterdam 1175-2011" (pp. 104-312) by Gawronski and five colleagues. The structure of the catalog is detailed (pp. 104-107, 15 b-w images). Chronologies and details on the ceramic types, catalog captions, and the structure of Appendix 1 are considered. The ceramic typology differentiates GP Greyware, Greyware, Proto-stoneware, stoneware, Redware, slipware, Whiteware, Faience, Porcelain, Industrial Stoneware, Industrial wares, and Industrial European porcelain. Nine periods are documented in the catalogue: 1175-1300 (pp. 108-119, 63 color and 38 b-w images); 1300-1350 (pp. 120-126, 24 color and 24 b-w images); 1350-1425 (pp. 128-144, 93 color and 56 b-w images); 1425-1500 (pp. 146-155, 52 color and 34 b-w images); 1500-1575 (pp. 156-175, 114

color and 63 b-w images); 1575-1625 (pp. 175-213, 222 color and 106 b-w images); 1625-1700 (pp. 214-267, 267 color and 119 b-w images); 1700-1850 (pp. 268-301, 234 color and 62 b-w images); and 1850-2011 (pp. 302-312, 81 color and 7 b-w images). "Appendix 1: Amsterdam Archaeological Sites and Typology" (pp. 314-330) lists 1,247 sites and "Appendix 2: Ceramic Production Centres" (p. 331) tabulates 49 ceramic production centers in Europe and Asia and provides site longitudes and latitudes. "Literature" (pp. 333-334) has 56 entries and 4 Websites and "Acknowledgments" (p. 335) includes information on the publisher, images, and graphics.

This instructive, lavishly illustrated monograph is extremely valuable – perhaps essential -- for historical archaeologists dealing with ceramics and other material culture from Dutch settlements in the Low Countries, New World (such as New Amsterdam) and Southeast Asia. The historical essays provide valuable contexts about the expansion of the city and industries, the functioning of the city and the daily life of locals. The illustrations of ceramics and other material culture are placed in chronological contexts. No measurements of ceramic object sizes are listed with the illustrations.

***English and Irish Delftware, 1570-1840***, Aileen Dawson, London: British Museum Press, 2010. 320 pp., 250 color illustrations. ISBN-10: 0-7141-2810-4, ISBN-13: 978-0-7141-2810-8, $70.00 (hardback). The David Brown Book Company has it available for $64.00.

Aileen Dawson is the curator of the British Museum's post-medieval collections (1660-1800) and Europe (1660-1800) and is responsible for collections which include an extensive group of ceramics and glass, enamels, ivories and about 90 pieces of portrait sculpture. Her interests are French and German porcelain, English pottery (especially 18th century Wedgwood and Staffordshire productions) and glass. She established and is also in charge of the Ceramic Study Centre (open by appointment for study of post-medieval ceramics and glass not currently on public view). Previously, she worked for the Victoria and Albert Museum (Ceramics Department) and the National Trust, Waddesdon Manor, Buckinghamshire. Dawson is the author of *Masterpieces of Wedgwood*, British Museum Press, 1995 (revised ed.); Portrait *Sculpture, a Catalogue of the British Museum collection c. 1675-1975*, British Museum Press, 1999; *A Catalogue of French Porcelain in the British Museum*, British Museum Press, 2000 (revised ed.); and *The Art of Worcester Porcelain 1751-1788, Masterpieces from the British Museum Collection*, British Museum Press, 2007.

In *English and Irish Delftware 1570-1840*, Dawson discusses a popular and widely available ceramic perhaps better known on the Continent rather the in the British Isles. Delftware, made in Europe since the 15th century, is an earthenware covered with a glaze containing calcined lead to which ashes of tin have been added to produce an absorbent white surface. In 1567, two potters from Antwerp, Flanders, Jasper Andries and Jacob Jansen, came to Norwich, East Anglia, to escape religious persecution and in 1570 applied for a patent to produce tin-glazed earthenware, but the application failed. Jansen traveled to Aldgate, London and began working at a tin-glaze pottery in 1571. Floor tiles and drug pots were made in Aldgate in the 16th century by Jansen and other immigrant potters from the Low Countries. In the early 17th century, factories making dishes and other wares were established in London near the River Thames. Their products were initially influenced by Chinese porcelain as well as by Italian maiolica.

Manufacture spread from London to centers such as Bristol, Liverpool, and Dublin. Known as "gally ware" in the 17th century, this type of pottery has come to be known as "delftware" named for the Dutch town of Delft which was renowned for its manufacture. Although impervious to liquids, delftware is fragile as it is kiln-fired at relatively low temperatures (both the biscuit and glaze firings at 980-1000° C). It was made for many domestic uses: for eating and drinking, for pharmaceutical and hygienic purposes, and frequently for display. It was usually decorated by hand with painted inscriptions, coats-of-arms or splendid scenes, in the main, biblical, allegorical or pastoral, or in imitation of Chinese styles. The painting was commonly blue-on-white but included polychromes. Delftware production continued in centers throughout the British Isles, including Ireland, until the early 19th century, although from the middle of the 18th century it began to be displaced by both porcelain and durable cream-colored earthenware after nearly 300 years of continuous production.

This monograph and catalog has a "Preface and Acknowledgments" (pp. 6-7) and an "Introduction" (pp. 9-17) in which Dawson defines the ceramic and its historic background. In "Collecting delftware" (pp. 18-22) and "Collecting delftware at the British Museum" (pp. 23-27), she describes the British Museum's collection of delftware, established in the later part of the 19th century by Augustus Wollaston Franks (1826-1897) who started acquiring specimens in the 1850s and continued until his retirement in 1896. The corpus is not the largest collection in the world but is described as the one of the finest and especially notable for the number of

pieces bearing dates and for those that recorded historic personages and *events.* The remainder of the book contains nine sections that document the themes represented in this English and Irish Delftware collection. Each piece represented in the catalog provides information on the date and location of production, provenance, a description of the ceramic, and its function and has at least one color illustration. An overview of the sections is presented (pp. 28-29) and the content summarized below.

"Political and historical delftware" (pp. 30-93, 63 illustrations of 32 ceramics): jars, mugs, wine bottles, chargers, flasks, dishes, plates, and tiles. "Religious subjects" (pp. 94-107, 14 illustrations of 7 specimens): jugs, dishes, and a "bird." "Armorial decoration" (pp. 108-147, 39 illustrations of 17 pieces): mugs, dishes, plates, wine bottles, a drug jar, and a salt (a rectangular open container for salt). "Delftware for the pharmacy" (pp. 148-159, 7 illustrations of 6 vessels): storage jars, wet and dry drug jars, barber's bowl, ointment pots, and honey pots. "Drinking" (pp. 160-225, 78 illustrations of 34 examples): tankard or jug, wine bottles, mugs, posset pots and covers, a fuddling cup, cisterns, flasks, goblets, caudle cup, punch bowls, teapots, tray, tea canisters, and bin labels. "Delftware for the table" (pp. 226-265, 42 illustrations of 24 vessels): dishes, plates, salts, jars, a bowl, and "Merriman" plates. "Delftware for leisure" (pp. 266-273, 5 illustrations of 4 ceramics): dishes, a gaming dish, and money box. "Flower holders" (pp. 274-278, 9 illustrations of 7 pieces): flower holders, flower bricks, bulb pot, and wall vase. "Ornaments, water bottles, fragments, and tiles" (pp. 284-299, 16 illustrations of 10 examples): ornament, plaque, water bottles, jugs, a "cat" jug, and floor and wall tiles.

There are ten "Profiles of chargers and dishes" (p. 300) and a tabulation of 28 pieces of "English delftware destroyed on the Second World War" (pp. 301-313, mostly plates and wine bottles and several jugs and drug pots. The book also has "Notes" (pp. 304-314) providing chapter-by-chapter references on the individual specimens illustrated and a "Bibliography" (pp. 314-315) with 93 listings. An extensive four-column "Index" (pp. 316-320) of proper nouns and topics is very useful. This superbly illustrated book featured 143 items from this extensive collection and include pieces which have never before been fully described or published in color. It is a welcome addition to the literature of historical archaeology.

***Southeast Asian Ceramics Museum, Bangkok University***, Roxanna M. Brown, Pathum Thani: Bangkok University Press, 2009. 136 pp., 150 illustrations (bilingual Thai and English), ISBN 978-974-219-215-0, $166.70 (hardcover).

This monograph-catalogue is labeled as "First edition 2009, 1,400 copies" and was Brown's final publication, completed by colleagues, following her sudden, unexpected passing; see "Obituary: Roxanna M. Brown. *SAS Bulletin* 31(3):19-20 (2008). She was a highly recognized authority on ceramics, director of the museum, and author: *The Ceramics of South-East Asia, Their Dating and Identification* (1977, reprinted 1988, 2nd ed. 2000); *Legend and Reality, Early Ceramics from South-East Asia* (1978); *Guandong Ceramics from Butuan and Other Philippine Sites* (1990); *The Ming Gap and Shipwreck Ceramics in Southeast Asia*, unpublished Ph.D. dissertation, Department of Art History, University of California, Los Angeles (2003). She collaborated with Sten Sjostrand on *Maritime Archaeology and Shipwreck Ceramics in Malaysia* (2002) and her revised dissertation was published as *The Ming Gap and Shipwreck Ceramics in Southeast Asia: Towards a Chronology of the Thai Trade Ware* (Roxanna Maude Brown; Eileen Deeley, Beatrix Latham, and Karl E. Weber, eds.; Bangkok: The Siam Society, 2009), reviewed in *SAS Bulletin* 33(1):15 (2010).

In the current volume under review there is an "Appreciation" by the former Thai Permanent Secretary for Culture and a "Preface" by Petch Osa, Chairman of the Southeast Asian Ceramic Foundation. The initial section, "The Southeast Asian Ceramic Museum: One of Bangkok University's Prides" (pp. 13-25) provides the background on how the museum's collection was assembled, the donation of 2,000+ pieces by the late collector, Surat Osathanugrah, who stated that "pottery is a part of our national heritage" and concluded that Thailand "needed a good ceramics museum." Hence, in 2000 he funded the construction of the first building of the Southeast Asian Ceramic Museum complex with permanent and special exhibition galleries all designed by Thai architects that was built partially below ground level on the university campus so as not to obstruct the library or other buildings. A subsequent addition to the galleries in 2004 was the "Extension Building," which housed administrative offices, meeting rooms, the Ceramics Library, Ceramics Conservation Laboratory and Research and Curatorial Preservation Department. These state-of-the art buildings won a 2008 Gold Medal from the Association of Thai Architects and a 2009 "Green Award" for environmental controls and landscaping. The museum also features three full-size kilns: a cross-draft

kiln, Sukhothai type kiln (found in southern Thailand), and Lanna kiln (found in the north). A table on p. 27, "Milestones of the Southeast Asian Ceramic Museum," documents the history of the museum from its founding in 1963 through 2009.

"Ceramics Technology" (pp. 29-34) provides definitions of earthenware, stoneware, porcelain, three glazes, and kiln stacking techniques (tubular and disc-shaped supports and mouth-to-mouth and base-to-base forms). Ceramic shapes are also defined: bottles, kendis (jugs with prominent pouring spouts), ewers, water droppers, covered boxes and dishes (dishes, bowls, saucers, and stemmed plates). In "Prehistoric Pottery" (3000-2500 BC) the Ban Chiang site representing Lop Buri culture is mentioned. For further reading see: *Prehistoric Thai Ceramics: Ban Chiang in Regional Cultural Perspective* by Armand J. Labbe, Bangkok: White Lotus Press (2002). Also documented are "Khmer Ceramics" 9th-14th centuries), and "Ceramics Found from Shipwreck Sites in Southeast Asia" for three phases: 1380-1430 (Early Ming), 1488-1505 (Ming), and 1520-1560). Other topics include "Northern Thai/Lanna Ceramics" (late 14th to late 16th centuries); "Si Satchanalai and Southeast Asian Trade Ceramics" (138-1580); and "Storage Jars" (specimens from Thailand, Cambodia, Myanmar, China, Vietnam, and Laos). A "Chronology for Thai, Vietnamese, Chinese and Myanmar Trade Wares" (pp. 51-57) synthesizes six phases, ca. 1368-1584 and the "Ming Ban" (or Gap) when China banned ceramic exportation which triggered a "Golden Age" for Southeast Asian ceramic production, especially in Thailand. The six well-defined production phases were: 1368-1400, 1400-1424/30, 1424/30-1487, 1488-1505, 1500-1520, 1520-1580. The fourth phase, 1488-1505 is best known from shipwreck sites near Myanmar (celadon also dates to this period, 1470-1510). Two basic Thai domestic ceramics, architectural fittings and fixtures and votive figures and figurines are also discusses as are "The Tak-Omkoi Burial Sites," 14th-16th centuries in western Thailand, and "Chinese Ceramics Found in Thailand" dated 800-1500 CE. The volume concludes with a "Catalogue of the Masterpieces" (pp. 67-133), depicting 72 ceramic specimens (vessels, figures, and plaques) dating from 1000 BC through the 16th century. The catalogue include splendid color picture with full descriptions and measurement of the ceramics. This monograph-catalog provides an appropriate introduction to the museum's collections and is superbly illustrated. The half-dozen images that depict the museum's exterior and galleries and the illustrations and descriptions of the pottery entice the reader to visit this significant museum.

**Previous Meetings**

*The **45th Annual Conference on Historical and Underwater Archaeology*** was held 9-12 January 2013 in Leicester, Great Britain. Contributions to ceramics were well represented; individual papers and a poster were presented and one session was devoted to ceramics. Abstracts are available on the SHA website, found at https://www.conftool.com/sha2013/sessions.php. Titles include: "Pottery in the colonies: the silent marker revisited" by Javier Iñañez, Marisol Madrid i Fernandez, and Jaume Buxeda i Garrigos; "Portuguese Faience in Brazil's 17th century Capital" by João Pedro Gomes; "Computer Vision Technologies and Historical Archaeology's Ceramic Typologies" by Patrice L. Jeppson, Kamelia Aryafar, and Ali Shokoufandeh; "Analyzing Color in Historic Refined Earthenwares Using Spectrophotometry" by John Chenoweth and Alan Farahani; "Abalone Shell, Broken Pots, Hearths, Windbreaks and Archival Research: Clues to Identifying 19th Century California Abalone Collection and Processing Sites on the Channel Islands" (poster) by Judy A. Berryman; "In small things remembered; the sponge decorated ceramics from Inishark, Galway" by Franc Myles; "The BISC 2 Cargo (Part I)--Contributions and Questions from Ceramics Analysis: Late 18th Century Sequencing and Colonial Trade Patterns" by Chuck Lawson, Stephen Lubkemann, David Morgan, Justine Benanty, Ken Wild, Jaco Boshoff, Sean Reid; "The BISC 2 Cargo Part II--Prestige Cargo or Evidence of Colonial Dumping? An Exploration of What Key Items in BISC 2's Cargo of Ceramics May Say About Center/Periphery Trade Relations in the Late North American British Empire" by Justine Benanty, Charles Lawson, Stephen Lubkemann, Ken Wild; "Old Pots on New Plates: Understanding Ancient Vases on 19th Century Transfer-Printed Ceramics: by Emanuela Bocancea; **"**Portuguese ceramics in Plymouth (UK)" by Tania Manuel Casimiro, Sarah Newstead; "Portuguese fine red coarsewares" by Mario Varela Gomes and Rosa Varela Gomes;"Portuguese Ceramics from Newfoundland, Canada" by Sarah R Newstead and Tânia M Casimiro;"Introduction to a local ceramic culture: the tableware used in colonial Guadeloupe, French West Indies" by Myriam Arcangeli and "Antebellum Ceramic Importers of New Orleans, Louisiana" by Sara A. Hahn and Thurston H. Hahn III.

General Session 2: "Any Colour You Like: International Perspectives in Ceramic Analysis" had eight presenters: "The circulation of college crockery in Cambridge, England, c.1760-1950: an urban archaeological tracer dye?" by Craig Cessford; "Early pottery manufacturing in Sydney, Australia, 1801-1830" by Mary Casey; "English

ceramics in Gdansk, Poland" by Joanna A. Dabal; :Exotic consumption: the character and changes in significance of Chinese porcelain used in 18th-century Copenhagen" by Rikke Søndergaard Kristensen; "Slave Quarters, Stand, or Trash Dump? Determining Site Function at the Food Plot Site" by Jessica Gisler; "Frontier Access in East Tennessee: A Ceramic Analysis of Ramsey House (40KN120), Bell Site (40KN202), and Exchange Place (40SL22)" by Abby J. Naunheimer; "Understanding Variation in Utilitarian Ceramic Assemblages of the Chesapeake: The Impacts of Local Production" by Lindsay Bloch; and "Pottery and Identity: Elites in Puerto Rico" by Charles Cheek.

*The **114th Annual Meeting of the Archaeological Institute of America*** was held in Seattle, Washington, USA, 4-6 January 2013. There is additional information on the AIA Web site: http://aia.archaeological.org/webinfo.php?page=10358. The "Gold Medal Colloquium in Honor of Jeremy B. Rutter: Minding the Gap: A Problem in Eastern Mediterranean Chronology, Then and Now" had six papers that mention ceramics. There were 19 additional papers, seven in a single session. These included the session "New Analytical Perspectives on Ceramics in Korinthia, Attica, and the Argolid": 1) "Production and Consumption of Late Mycenaean Pottery from Kanakia, Salamis, and Attica: an Integrated Analytical Approach" by William D. Gilstrap, Peter M. Day, Vassilis Kilikoglou, Noemi S. Müller, Elina Kardamaki, Konstantina Kaza, Yannos Lolos, Christina Marabea, and Apostolos Papadimitriou; 2) "Analyze That! Style and Composition in the Early Helladic II Ceramics from the Health Center Excavations at Koropi, Attica" by Peter M Day, Kerasia Douni, Anno Hein, Vassilis Kilikoglou, Maria Relaki, and Olga Kakavoyianni; 3) "Ceramic Fabric Analysis and Urban Survey: the Case of Sikyon" by Conor Trainor, and Evangelia Kiriatzi; 4) "Crafting Choices: Early Helladic Ceramic Production and Consumption in Corinthia and the Argolid, Greece" by Clare Burke Davies, Peter M. Day, Daniel Pullen, James Wiseman, Anthi Theodorou-Mavrommatidi, Angeliki Kossyva, and Alcestis Papadimitriou; 5) "A Petrographic Study of Late Helladic Cooking Pots from the Corinthia" by Debra A. Trusty; 6) "In and Out of the Stream: Investigating Cycles of Development and Recession of a Specialized Potting Center on Aegina" by Evangelia Kiriatzi, Walter Gauss, Gudrun Klebinder-Gauss, Myrto Georgakopoulou, Areti Pentedeka, Bartek Lis, Michael Lindblom, and Jerolyn Morrison; and 7) "The Production and Distribution of Corinthian Cooking and Southern Argolid Fabrics in the Late Roman Northeast Peloponnese" by Heather Graybehl, Samantha Ximeri, Mark D. Hammond, Christian Cloke, and Peter M. Day.

Twelve individual presentations: "13th Century B.C.E. Feasting at Tell el-'Umayri: Faunal, Vegetal, and Ceramic Evidence" by Gloria London; "Ceramics and Change in Late Antique Augusta Emerita" by Daniel Osland; "Argive Geometric Pottery: Some Remarks on Chronological Issues from New Funerary Evidence" by Camila Diogo de Souza; "A Preliminary Examination of the Miniature Vessels from the Bronze Age Site of Iklaina" by Joann Gulizioj; "An Overview of Brazilian Studies on Greek Pottery: Tradition and Future Perspectives" by Camila Diogo de Souza and Carolina Kesser Barcellos; "Microstratigraphic Study of a Middle Bronze Age Updraft Pottery Kiln, Kolonna Site, Aegina Island, Greece" by Panagiotis Karkanas, Francesco Berna, Walter Gauss, and Dan Fallu; "Two New Neopalatial Pottery Deposits from the Minoan Palace at Gournia" by R. Angus K. Smith; "An Etruscan Red Figure Lekane: Meaning and Shape at Caere" by Laura Ambrosini; "Recovering Samnite Identity and Economic Structure in the Roman Republic: A Pilot Study of the Black-gloss Ceramics from the 1999 Excavations of Monte Pallano, Abruzzo" by Hillary Conley; "The Role of Attic Imports in Apulian Grave Assemblages" by Bice Peruzzi; "Ceramics, Shepherds, and the Regional Economy in Late Antique Southern Italy" by Darian M Totten; and "A Medical Vessel from the Athenian Agora" by Susan I. Rotroff.

**Forthcoming Meetings:**

***PER TERRAM, PER MARE: Production and Transport of Roman Amphorae in the Eastern Mediterranean*** is scheduled for Nicosia, Cyprus, 12-15 April 2013. An international conference organized by the Roman Amphorae from Cyprus (ROMACY)* project and the Maritime Archaeology Research (M.A.RE) Lab, Archaeological Research Unit, Department of History and Archaeology, University of Cyprus. The aim of the conference is to provide an in-depth and multi-faceted approach to amphora studies and to produce a synthesis of the data obtained from recent research in the eastern Mediterranean. The intention is to bring together specialists from various fields in order to exchange ideas and communicate results on issues relating to the nature of amphora production and trade. The topics that will be addressed range from typology, archaeometry and seaborne trade to statistical analysis and theoretical perspectives. The conference will comprise oral presentations and workshops, including the demonstration of manufacturing techniques in a pottery workshop, the

examination of the finds from an amphora kiln-site and the inspection of thin-sections of eastern amphorae identified in Cyprus. The objective is to achieve a practical understanding of the issues that will be examined during the sessions and to stimulate further discussion. The programme will include excursions to a number of archaeological sites. English will be the official language of the conference.

* The Roman Amphorae from Cyprus (ROMACY) project (DIDAKTOR/06/09/62) is co-financed by the European Development Funds and the Republic of Cyprus through the Research Promotion Foundation (RPF).

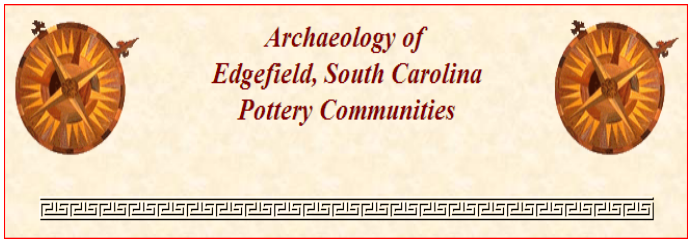
*The* ***First International Conference on Neutron Imaging and Neutron Methods in Archaeology and Cultural Heritage Research*** (NINMACH), in cooperation with the International Atomic Energy Agency (IAEA, is scheduled to be held at Technische Universität München, Garching, Germany, 9-12 September 2013. Talks and posters will be presented by physicists and archaeologists who have already employed neutron methods successfully; attendance is explicitly recommended for scientists who are completely new to neutron methods and want to learn about the possibilities at neutron sources throughout the world. The pre-registration and call for abstracts have been issued: http://www.frm2.tum.de/aktuelles/veranstaltungen/ninmach-2013/index.html. In the recent years, modern scientific methods have led to a wealth of information in Archaeology and Cultural Heritage Research concerning the composition of artefacts both on a molecular level and on the mechanical built of objects than cannot be dismantled without destroying them. X-ray methods from radiography to fluorescence have become widespread, but the potential of neutron methods has barely been tapped. Neutrons easily penetrate thick layers of metals, even lead, while revealing organic material like wood, leather or bones in sealed metal or stone containers. Two- and three-dimensional imaging provides visual information, while neutron activation analysis delivers elemental composition information, and neutron scattering reveals alloys and textures. With modern detectors, Neutron Imaging can even be performed at low-power research reactors; the application for cultural heritage research gives rise to new uses to elder small research reactors throughout the world, which is explicitly supported by IAEA. Methods will include Neutron Imaging: Radiography and Tomography, Autoradiography, Activation Analysis, Prompt Gamma Activation Analysis, Neutron Resonance Capture Analysis, Large Object Imaging with Fast Neutrons, Advanced Imaging Methods: Bragg Edge Scanning, Phase Gratings, Texture, and Scattering Methods. Ceramics is one of the nine archaeological subjects to be covered.

**Field School**

***Archaeology of Edgefield Pottery Communities Summer Field School*** sponsored by the University of Illinois, is scheduled 26 May to 8 July 2013. This field school will focus on investigations at the Pottersville site (also called Landrumsville) and nearby John Landrum and B. F. Landrum kiln sites within the area of the Old Edgefield Pottery District, and will provide training in the techniques of excavation, mapping, artifact classification and contextual interpretation.

Students will work in supervised teams, learning to function as members of a field crew, with all of the skills necessary for becoming professional archaeologists. Many students from past University of Illinois field schools have gone on to graduate study and professional field-archaeology positions. Laboratory processing and analysis will be ongoing during the field season. Evening lectures by project staff, visiting archaeologists, and historians will focus on providing background on how field data are used to answer archaeological and historical research questions.

For additional information about this field school opportunity, please contact Chris Fennell by email at cfennell@illinois.edu or by cell phone at 312-513-2683. To apply for participation in this field school, please download and complete a short application form and submit it to Fennell by March 25, 2013. Students will be notified of acceptance no later than April 10, 2013. Accepted students should register for six credits in the University of Illinois summer session. Students from colleges other than the University of Illinois can register through our exchange program and receive transfer credits. Additional information and application forms are available at http://www.histarch.uiuc.edu/Edgefield/



## BIOARCHAEOLOGY

*Katy Meyers, Associate Editor*

**A Comment on Colored Bones**

When bones are recovered in archaeological contexts, they are never the pure white ones you see in collections or on display. Nor are they always tinted brown from years in soil. Bones can be a number of colors including black, red, yellow, white or green. Sometimes the coloration can be due to natural processes within the soil, and sometimes they are an indicator of cultural activities. Color can be painted or stained directly onto the bone or can be placed on the skin and become imprinted on the skeleton following putrefaction. It can also be accidental but still due to the nature of the funerary rituals. Whenever a bone appears to have a difference in pigment, or there is variation in color between individuals in a similar area or on a single individual, we need to investigate the reasons behind it. Recently, the discussion of coloration has grown as research into new types and purposes of pigmentation are discovered. Three recent articles from the ***Journal of Archaeology Science*** discuss red, yellow and black color found on bones.

Red pigment was found on skeletal material dating to the Copper Age from Spain, and is examined by Rogerio-Candelera et al. (2013). While this type of practice has been widely documented throughout the Iberian Peninsula during this period, it is often attributed to the ritual placement of local raw iron oxides or ochre on the skin of the deceased. However, a closer investigation into the red pigmentation is done in order to further understand its significance. Rogerio-Candelera et al. (2013) examine a burial in a megalithic structure at Montelirio. Four individuals found in the first chamber had numerous beads and potsherds, 12 fragmented arrowheads, and other artifacts. One individual there was buried with 23 flint blades, one flint halberd with amber pommel, a number of ivory objects and a copper awl. All had red pigmentation on their bones, and some of the grave goods were colored as well.

Twelve samples were taken of the pigment and submitted to x-ray fluorescence, x-ray diffraction, micro Raman spectroscopy, and Fourier-transform infrared spectroscopy. The analysis showed that the color was produced by cinnabar and ferric oxides. The magnetic and hydrothermal origin of the cinnabar suggests that it was not a local material, but rather may have been found miles from the site. Geological studies have shown that cinnabar is only found in specific locations remote from the site under investigation. From this, the archaeologists infer that it would have held both symbolic and social value. Since red pigments have not been found in domestic sites, it is thought to have funerary significance or related to the world of the dead. The presence of this exotic commodity also suggests either a distribution or trade-based network. The actual symbolic meaning of the red burials is unknown, but it may be a certain form of social differentiation. Red pigmentation is often found in association with other exotic grave goods such as ivory, and is only found in a limited number of burials. Rogerio-Candelera et al. (2013) conclude that the scarcity of cinnabar, combined with the funerary context, suggest that it was both ritual and a display of status.

Both yellow and red pigmented bones have been found at the Mayan site of Jaina, and are investigated by Batta et al. (2013). The site, which was occupied from 250 to 900 AD, had a total of 95 burials. The skeletal population found at Jaina appear to comprise a number of different social groups, either status or family based. Eight of the individuals had dental decoration, of jadeite, pyrite and hematite, suggestive of elite status. All burials found at this location had red coloring on the remains, but only 12 had yellow coloring as well. Both the red and yellow are analyzed and compared with other variables to determine what potential religious or symbolic significance they might have had. Testing of the color was done using x-ray fluorescence, scanning electron microscopy, atomic force microscopy, and electron diffraction. The yellow coloring was determined with be an iron-hydroxide mixed with sand or clay, and the red was either cinnabar or red hematite. Further analysis of the yellow determined that it was derived from hematite- a pigment that is usually red. It is thought that either the yellow hydrolyzed and changed in color following burial due to natural conditions, or the pigment was intentionally altered to create yellow. However, given the conditions of burial, it is thought post-burial alteration of red to yellow is more plausible. Therefore, the appearance of yellow is due to natural change rather than purposeful status or ritual differentiation. Batta et al. (2013) argue that all individuals found at Jaina were buried with red hematite body coloration, and due to the conditions of burial some portions turned yellow. Therefore, color is not used to differentiate status, and yellow is unrelated to funerary custom.

Argáez et al. (2011) discusses the appearance of black pigmentation on skeletal remains from Mexico. The authors ascribe the coloring to a potential number of substances including manganese oxide, graphite, asphalt or bitumen, all of which create a black color on bone. Two populations were examined from Mexico that had evidence of black coloration: Tlatelolco, a postclassical

site from the 14th to 16th centuries CE and Tlapacoya, a preclassical site from the 10th to 8th centuries BCE. Three samples were taken from the first site and only one from the second. A small portion of the colored bone was removed from the skeleton, ground up, and was submitted to x-ray fluorescence, x-ray diffraction and scanning electron microscopy. These methods revealed that the black substance on the bones could be attributed to bitumen, a black organic substance that is also found on the insides of shrouds from Albanian archaeological sites. Given the location of the coloring on the joints and knowledge of the region's history, Argáez et al. (2011) argue that it was likely the coloring was accidental and was imparted during a dismembering process prior to burial. The bitumen may have been part of a hot substance, hot because the bone was thermally altered, that was used to ease in the dismemberment process by being a lubricant for tools.

Bones can change in color for a variety of reasons, and as these articles reveal, it is important to examine both the chemical composition and context before interpreting it. Rogerio-Candelera et al. (2013) showed that red coloration was related to status, Batta et al. (2013) determined yellow was produced through natural causes, and Argáez et al. (2011) concluded that black was caused by funerary preparation. While similar methods were used, they came to drastically different conclusions regarding the nature and use of color.

**Upcoming Conferences**

During this Spring, there are a few conferences of relevance to bioarchaeologists. The first is the ***Society for American Archaeology*** meeting from April 3-7, 2013 in Honolulu, Hawaii. While the meetings will have a number of archaeological talks and workshops, bioarchaeologists in particular will be interested in the Wednesday excursion to Joint POW/MIA Command (JPAC), Central Identification Laboratory which has been searching the world for missing Americans since 2003. There are sessions on "New Approaches to the Archaeological and Bioarchaeological Study of South American Hunter-Gatherer societies," "Children and Childhood in the Past: Exploring Biological and Social Transformations of Children in Antiquity Through Emerging Bioarchaeological Method and Theory," "Isotope Ecology and the Ring of Fire: Bioarchaeology in the Pacific," "Bioarchaeology of Northeast Asia," "Bioarchaeology in the Americas," and various relevant poster sessions. There will also be two sessions on mortuary studies in general, with one of particular interest: "Bodies of Evidence: Integrating Mortuary and Osteological Analyses."

The ***Meeting of the Paleopathology Association*** will be April 9-10, 2013 in Knoxville, Tennessee. There will be two special workshops regarding analysis of trauma and rheumatic diseases. In addition, a special symposium will be held in honor of Dr. Donald Ortner. Following this at the same location from April 9-13, 2013 is the ***American Association of Physical Anthropologists Meeting***. The meeting will have a special luncheon talk featuring Dr. William Bass. The talk, titled "The Autopsy of the 'Big Bopper:' My Role in Investigating the Death of an Early Rock & Roll Icon," will discuss his recent investigation of the remains of J.P. Richardson who died along with rock superstars Buddy Holly and Ritchie Valens on Feb. 3, 1959.

## Remote Sensing and Prospection

*Apostolos Sarris, Associate Editor*

**Announcements for Conferences, Workshops & Training Schools**

***Word, Space, Time: Digital Perspectives on the Classical World***, University at Buffalo, SYNY, New York, 5-6 April 2013. The aim of this interdisciplinary conference organized by the Digital Classics Association (DCA) is to provide a survey of current approaches to digital methods of research, teaching, and outreach across classical sub-disciplines, with the goals of further opening inter-disciplinary perspectives and establishing common objectives for digital research and education.

Archaeological GIS, digital historical mapping, literary text mining, and other computational techniques are increasingly shaping how we understand classical antiquity. Digital methods are breaking down sub-disciplinary barriers, allowing literary scholars to more easily explore inscriptions, archaeologists to place their findings on digital historical maps, and philosophers to explore style and argument with sophisticated search techniques. Digital tools also offer new ways to explain aspects of classical antiquity in the classroom and to the public at large. For more information: http://apaclassics.org/index.php/world_of_classics/calls_for_papers_full/cfp_word_space_time_digital_perspectives_on_the_classical_world/

***First International Conference on Remote Sensing and Geo-information of Environment***, Paphos, Cyprus, 8-10 April 2013. The conference is organized by Cyprus University of Technology and CRS, ESA-European Space Agency, ETEK-Cyprus Scientific and Technical Chamber, Cyprus Meteorological Service, Department of Electronic Communications of the Ministry of Communications and Works. Organizers invite scientists, researchers, students, and other professionals to address and discuss emerging issues in remote sensing and geo-information of environment. The keynote speakers and thought-provoking technical program will encourage the exchange of ideas and provide the foundation for future collaboration and innovation. The Technical Program is open to all topics in Remote Sensing and Geo-information of Environment and related techniques and applications. For more information: http://www.cyprusremotesensing.com/rscy2013/

***4th EARSeL Workshop on Cultural and Natural Heritage***, Matera, Italy, 6-7 June 2013. The First Workshop on Advances in Remote Sensing for Archaeology and Cultural Heritage Management took place in Rome on 30 September - 4 October 2008, organized by the chairmen of the EARSeL SIG Remote Sensing for Natural and Cultural Heritage (ReSeArCH). A large scientific community composed of archaeologists, geophysicists, experts in aerial archaeology, remote sensing and geomatics, gave rise to a lively debate on the potential, limitations and overlook of traditional and novel Earth Observation Technologies for archaeology and cultural heritage management applications.

The interest of the scientific community increased over years, thus pushing the SIG ReSeArCH to yearly organize dedicated sessions on Cultural Heritage within EARSEL Symposia (Chania 2009, Paris 2010, Prague 2011), to the joint conference with AARG in Poznan (21-23 September 2011) and the most recent Workshop in Ghent (19-22 September 2012).

After five years from the Rome Workshop, the scientific interest for Remote Sensing and Cultural Heritage has strongly increased. The available technologies as well as methodological approaches improved thus facilitating a larger use, mainly for archaeological purposes. In this lively cultural and scientific context, the 4th Workshop will take place on 6-7 June 2013 in Matera.

The cultural and practical interconnections between Environment, Culture and Territory are the framework of this event. The scientific committee selected some priority themes related to: (a) fields of application such as the use of remote sensing for risk management and cultural and natural heritage, interconnection between environmental, climatic changes and dynamics of human frequentation, the aware fruition of material and immaterial witnesses of ancient civilizations, (b) methodologies such as development of ad hoc semiautomatic and automatic approach for extracting cultural information, integration and fusion of passive and active remotely sensed data, remote sensing and geospatial analysis for preventive archaeology, palaeoenvironmental investigation and risk management and (c) cooperation strategies for the creation of a permanent platform for data and knowledge sharing.

The Workshop will be organized in the framework of the 33rd EARSeL Symposium. For more information: http://www.earsel.org/SIG/NCH/4th-workshop/index.php

**Report on Past Conferences**

***UISPP commission IV symposium. New developments in the Application of Computers and Quantitative Methods in Archaeology,*** Leiden University, Leiden 2 November 2012. The following presentations were delivered during the symposium: Francois Djindjian: "On the good use of formalization and statistics to solve old archaeological problems : two case studies;" Jeroen De Réu**: "**Towards a cost-effective 3D documentation of archaeological excavations;" Ladislav Šmejda: "Death, space and time: new perspectives on the Holešov cemetery, Czech Republic;" Apostolos Sarris: "Manifold Approaches in Geo-informatics for Unfolding the Archaeo-landscape of Palaepaphos in Cyprus;" Chiara Piccoli: "Manual and procedural 3D modelling techniques to reconstruct archaeological evidence: the case study of Koroneia, Greece;" Hanna Stöger: "The Collective Insula. A Severan Neighbourhood in Ostia, Quentin Bourgeois: Walking along Ancestral Lines: Skyline analysis in the context of prehistoric barrow alignments in the Low Countries;" and Sjoerd van der Linde: "Really Simple Reporting: archaeological projects and the use of new media."

CAA Computer Applications & Quantitative Methods in Archaeology

## Book Reviews

*David Hill, Associate Editor*

[Assoc. Ed. Note: Publishers are beginning to send more volumes for review. If you know of the publication of a new volume or series of papers please pass that information on to me (David Hill) so that I can contact the publisher for a review copy. As usual, I am soliciting publications from outside the US/EU or from small research groups to broaden the range of reviewed material.]

***Conservation Biology and Applied Zoology.*** Steve Wolverton and R. Lee Lyman, editors. 2012. The University of Arizona Press, Tucson. 241 pp., 30 illustrations. US$55.00 (cloth) . ISBN 978-0-8165-2113-5.

*Reviewed by Sally C. Reynolds, School of Natural Sciences and Psychology, Liverpool John Moores University, Liverpool, UK.*

Applied zooarchaeology has much to offer conservation biologists and ecologists. Unfortunately, like poor Cassandra of yore, these warnings and predictions are largely unheeded by mainstream conservation professionals. This volume is an attempt to demonstrate to conservationists that the past can be, and is, very relevant to the future. The papers where originally presented at a conference session on applied zooarchaeology at the Society of Ethnobiology conference in 2010.

The types of datasets generated by zooarchaeological research are very readily applicable to conservation decisions, but the dialogue between these two fields has been somewhat hampered by factors such as methodological differences, non-overlap of practitioners, and a clear disparity in time-scales. In an attempt to demonstrate the value of the archaeological record to conservationists, editors Steve Wolverton and R. Lee Lyman have set out to compile a volume that aims to demystify the archaeological approaches and techniques and gives management implications at the end of each case-study, clearly articulating the importance of the results for policy decisions.

This volume follows on the heels of calls made since the last century for zooarchaeologists to use their skills and data to inform modern conservation policymaking (Lyman, 1996). This volume comprises ten chapters and the overarching theme of the volume is the interpretation of zooarchaeological data within the framework of management implications for conservation. While it is an excellent example of zooarchaeological datasets and interpretations in the services of conservation, I was somewhat disappointed that the case studies are largely centred on fauna of North America, but this is understandable given the conference on which the volume was based.

Chiefly, the datasets are able to address key questions and assumptions that underlie present-day management decisions, such as 'What were population levels in a given area before human colonisation?' 'Have species altered their diets and behaviour after human arrival?' and 'How did early human colonisers exploit specific natural resources?' amongst others. The majority of the contributions present results for single taxon or group as a case-study, but the general chapters, such as the chapter about the Overkill Hypothesis and the Rewilding Movement by Lisa Nagaoka make for good reading, also. The focal species cover a range of taxa, from bird species (the sandhill crane, *Grus canadensis*), to freshwater mussels, marine clams, fish (the Pacific Red Snapper, genus *Sebastes*) small mammals and large mammals (such as the Black Bear, *Ursus americanus*).

The papers are of high academic standard and present interesting perspectives from the past. However, for the volume as a whole to succeed in its mission, it must be read, used, cited and recommended by conservation biologists and decision-makers, in order to successfully integrate archaeological data into the accepted body of knowledge for conservation. This volume is an excellent source book for lecturers teaching students of conservation biology and archaeologists, as well as practitioners in conservation and archaeology. Will it be enough to break the Cassandra curse on zooarchaeology? I certainly hope so.

**References Cited**

Lyman, R. L. 1996. Applied Zooarchaeology: the Relevance of Faunal Analysis to Wildlife Management. *World Archaeology* 28:110-125.

***Exhuming Loss: Memory, Materiality and Mass Graves of the Spanish Civil War,*** Layla Renshaw. 2011. Left Coast Press, Inc., Walnut Creek, CA. 259 pp. US$36.95. ISBN 978-1-61132-042.

*Reviewed by Jonathan Kent, Department of Sociology and Anthropology, Metropolitan State University of Denver, PO Box 173362, Campus Box 28, Denver, CO 80217, USA.*

The author has reworked her dissertation, *Materialisation, memory and representations of the past in the exhumation of Republican mass graves from the Spanish Civil War* (2009, University College of London). An earlier version of some of the ideas present in this book was also published in volume 15 number 4 of the *Journal of Material Culture*, and she has become one of the foremost and widely-cited scholars on the archaeology of memory in Spain. The present work is a study of two rural communities in the Castile region of Spain that are participating in a project devoted to exhuming and reburying the dead from the Spanish Civil War (SCW).

Between 1936 and 1939, right-leaning Nationalist forces were under the command of General Francisco Franco who led a military coup against the existing government of the Popular Front party. Fighting on behalf of the government, and eventually defeated by Franco, were the more leftist Republicans. Those who died fighting as Republicans (including, in some cases, former officials of the Popular Front) were interred in unmarked common graves. In addition to the soldiers who actually died fighting, however, were Republican civilians and their families and sympathizers who were killed by the thousands after the war was over as part of a prevailing politic of lethal repression. These, too, were placed in mass graves, many of them located just outside the villages where they lived (as opposed to a "proper" burial in the village cemetery. These victims were frequently taken/kidnapped from their homes, often by gangs of villagers they knew, and killed for their beliefs and for supporting the Republicans in word or deed.

The politically motivated murders continued during the duration of Franco's rule, until his death in 1975. The threat of continued reprisals that hovered over the heads of the surviving relatives and friends of those civilian victims was certainly psychological and sometimes physical, and created a climate in which Spaniards were reluctant and/or afraid to discuss the circumstances of the civilian, post-SCW-related dead. It is the exhumation and reburial of these civilian dead that forms the basis of this books' treatment of the archaeology of memory.

The Preamble clearly describes these events and includes how democracy in the two decades after Franco was viewed as being very fragile. Newly elected officials believed that Spanish society could not withstand dredging up of the Francoist atrocities lest they reopen old wounds. Instead, they decided to prohibit discussion of what had happened during the Francoist regime in what became known as a "pact of silence".

In 2000, Amnesty International and various Spanish entities pushed for a more open treatment of the events of the Francoist years, including the identification and recovery of the victims of the repression. The United Nations became increasingly involved in investigations of human rights abuses and politically-motivated assassinations world-wide, and supported investigations of these in Spain, Argentina, Guatemala, Cambodia, Rwanda, etc. A leading organization in Spain was the Association for the Recuperation of Historical Memory (ARMH, using the Spanish acronym), and we learn how a significant part of their agenda included the exhumation of the Republican dead and restoring the memory of what happened to the National consciousness and the families of the victims.

It is these exhumations in two communities and the living people that are affected by them that form the focus of the book. Renshaw was a participant, along with some of her students, in the project. One of her primary goals in the book is to explore "…[t]he political and symbolic power of exhumation, and the many factors that contribute to it." (p.11). The impacts on the living of: memorializing the dead; digging up of their physical remains and personal items; analyzing the causes of death (usually in the laboratory); identifying the victims through the use of photos, personal mementos, and DNA; and, reburying them in marked graves are all treated with both sensitivity and objectivity by Renshaw. The social and personal contexts in which all of these occur are also significant components of the text.

After presenting a Preamble in which she expounds on some of the theoretical aspects of exhumation studies, including how powerful they can be, she opens her Introduction with a historical and methodological overview of the study. The events leading up to the Franco coup provide the background for the way life for anti-Franco Republicans is perceived by the surviving families of those villagers who were killed for mostly political reasons. She also discusses how there are strong divergences regarding the meaning of those killings, and this affects the dialog regarding how exhumation and reburial should and should not convey those different

meanings. This is one of the dominant themes of the book. Also discussed are the difficulties experienced by the author functioning as both an ethnographer and member of the human recovery team. Many of her informants were apparently equally ambivalent, and some suspicious, about her role in the project.

One of the most striking points of chapter 1 (Republican Identity and Spanish Memory Politics) and chapter 2 (Memory Idioms and the Representation of Republican Loss) is how much fear is still experienced by older members of the two communities studied. What becomes clear through Renshaw's analysis is that the families of the deceased continued to endure political, social, and psychological abuse for decades afterwards. (Readers interested in the politics of memory worldwide and issues relating to exhumations might also want to consult the Historical Justice and Memory Research Network *via* their web site, www.historicaljusticeandmemorynetwork.net.) This climate of fear accounts for continuing self-censorship of speech and public behaviors by the living long after the direct repression has disappeared (p. 93). Forensic archaeologists need to be aware of this when embarking on mass grave excavations, as it can prevent the living from offering complete information on the deceased. Threats received by archaeologists involved in the exhumations (p. 80) are also worthy of consideration by those who would participate in such projects.

Individual narratives form much of the data base for the author's analysis of the social context of the project. The work treats the scientific recovery of the dead, but it is simultaneously an ethnography of the relatives of the deceased, of the organizations working to recover and restore the memory of the dead, and of the archaeologists and forensic experts carrying out the exhumation and identification of those in the graves.

The author demonstrates some of the ways of dealing with the complexities of such research. Treated are: issues of class identity; a range of political ideologies; the horrors of expedient execution of dissidents; the revival of emotions experienced long ago; the process of forgetting the dead; the social and emotional costs of recovering their memory; and, a critique of the archaeologists and forensics experts engaging in what they suppose is an objective, dispassionate enterprise of transforming the once-living into evidence (see chapter 3 for a discussion of many of these issues).

Material culture (here items found with the dead) is the subject of much of chapter 4. It is concerned with the ways in which objects evoke memories and emotions (although not for all) among both the living descendant community members and the author's co-excavators. These grave goods (especially items like spectacles, watches, familiar shoes, and buttons) have not only a connection to the dead, but last beyond the point at which the body deteriorates, and thus take on a whole new reality of their own, perhaps independent of how they were used and thought of by their former owners. Because the exhumations were heavily charged with meaning, the project organizers had to be very conscious of how the media recorded the excavations. After all, the excavations themselves, although justified as a way of reuniting the dead and the living, were carried out with the additional purpose of documenting the Francoist atrocities, i.e., of breaking the 'pact of silence', a point to which the author returns in the concluding chapter.

In chapter 5, the author deals with presenting the results of the identifications of the deceased (many could not be individually identified) to the community and the range of concerns surrounding reburial of the dead. Negotiations regarding the choice of collective reburial vs. individual reburial (when identified) are described, and the political ramifications of the choice are analyzed in detail. Subject to her analysis as well are the ways in which her team members and the ARMH decided to deal with this debate and structured the reburial.

Such decisions may be applicable not only to the Spanish case described herein, but also could be illuminating to those dealing with reburial issues in other parts of the world, including those connected to NAGPRA cases in the U.S. It would seem that a cross-cultural approach to the politics of reburial would be a useful addition to the NAGPRA dialog.

This book may also serve as a guide to planning work with descendant communities whose ancestors are being exhumed. It is a multi-layered analysis of structural concomitants of years of terror, intimidation, and both physical and psychological repression as reflected in mass graves. I found it to be a transformative induction into the complex social context of exhumations.

***Lapis Luzuli from the Kiln: Glass and Glassmaking in the Late Bronze Age.*** Andrew Shortland. 2012. Studies in Archaeological Sciences. Leuven University Press, Leuven, Belgium. 160pp. US$89.50 (cloth). ISBN 978-90-5867-691-7.

*Reviewed by Michael B. Jacobs, Department of Chemistry, Metropolitan State University of Denver, PO Box 173362, Campus Box 52, Denver, CO 80217, USA.*

This book was enjoyable and exciting to read. It is written in a way that tells a chronological story about the history of glass and glassmaking during the Bronze Age, particularly glass and vitreous materials excavated from Egypt and the Near East. The author's target audience for writing the text is for a student of archaeology, but this is an excellent introduction for anyone who is interested in glass and glassmaking. The author presents his audience with a brief history of glass and with a plethora of information on ancient glasses and vitreous materials. Even though the text is introductory in nature, the author provides excellent sources for further study about glasses and glassmaking.

Shortland starts the book with a brief history and background of glass. The author presents maps, tables, Analytical data, and colored figures of excavated materials to tell the story about the birth and the importance of glass in societies during this time period. The Introduction (Chapter 1) of the text provides a brief introduction of the structure of glass, chemical composition, physical properties, temperatures, and the elements resulting in the colors observed in glasses. This chapter is an excellent introduction of the chemistry and materials science involving glasses and vitreous materials and is suitable for anyone with a general chemistry background. In Chapter 2, the author provides the reader with an introductory archaeological account of the culture, political power, and the role to which glass and glassmaking played in Egypt and the Near East during the Late Bronze Age. Chapter 3 presents the 1st glasses before 16th century BC and it's geographical locations of discovery.

Chapter 4 continues the story with the 1st regularly produced glasses in Egypt and Syrio-Palestine. The author presents to the reader glass crafted treasures such as beads, jewelry, and vessels excavated from Egyptian tombs, Tuthmosis III and Amenhotep II are a few examples. Chapter 5 tells a story about golden age of glass as the author describes. The author presents significant finds of glass from Nuzi (Northern Mesopotamia), and Amarna (middle Egypt), Tutankhamen, and the Valley of the Kings. In Chapter 6, the author discusses the glass industry and its workshops, presenting to the reader evidence for manufacture and production sites. Further discussion and analytical data is given for some of the raw materials, equipment, temperatures, and technologies used during this time period. Chapter 7 of the text is about the importance for analyzing the types glasses found and how to identify the glasses. Chapter 8 ends the story of glass and glass making about the decline in glassmaking. The author provides the reader with two excellent appendices the 1st appendix contains useful concise outlines of the Analytical techniques used to analyze the glass discussed in the text. The 2nd appendix provides the reader with analyses of chemical composition of these glasses. In addition the author provides a glossary, a reference section, and colored figures of many of the objects mentioned in the text. Overall, this text is an excellent and fun read. The author presents an outstanding amount of detail and information about the history, the importance, chemical composition, structure and, the utility of glass and glassmaking during the Late Bronze Age in this text. I recommend this text to every archaeology student or anyone interested in glass.

## UPCOMING CONFERENCES

*Rachel S. Popelka-Filcoff, Associate Editor*

**2013**

17-21 March. Pittcon Conference and Expo, Philadelphia, PA USA. General information: http://www.pittcon.org/

25-28 March. Across Space and Time: Computer Applications and Quantitative Methods in Archaeology. Perth, Australia. General information: http://caa2013.org

3-9 April. Society for American Archaeology. 78th Annual Meeting, Honolulu, HI USA. General information: http://www.saa.org/Default.aspx?TabId=1419

3-9 April. Paleoanthropology Society Meetings, held in conjunction with the Society for American Archaeology. Honolulu, HI, USA. General information: http://www.paleoanthro.org/meeting.htm

4-5 April. 47th Annual Meeting of the South-Central Section of the GSA, Austin, TX USA. Special session on "Proxy records of abrupt Holocene climate and environmental change" General information: http://www.geosociety.org/sections/sc/2013mtg/

7-11 April. 245th National Meeting and Exposition, American Chemical Society. New Orleans, LA USA. General information: http://www.acs.org. Special session: ACS Archaeological Chemistry Symposium

7-12 April. European Geosciences Union General Assembly 2013. Vienna, Austria. General information: http://www.egu2013.eu

9-13 April. Association of American Geographers (AAG) Annual Meeting, Los Angeles, USA. General information: http://www.aag.org/cs/annualmeeting

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

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

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

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

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

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

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

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

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

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

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

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

18-21 August. CANQUA-CGRG Biannual Meeting Edmonton, Alberta, Canada. General information: http://www.canqua.com/meetings.

20-24 August. International Symposium on Chert and Other Knappable Materials, Romania. General information: http://arheoinvestsymposium.uaic.ro/stone

25-29 August. Euroanalysis. Warsaw, Poland. General information: http://www.euroanalysis2013.pl/index.php?option=com_content&view=article&id=68&Itemid=435.

4-8 September. European Association of Archaeologists. Pilsen, Czech Republic. General information: http://www.eaa2013.cz/

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

19-21 September. 12th European Meeting on Ancient Ceramics (EMAC2013). Padova, Italy. General information: http://emac2013.geoscienze.unipd.it/

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

17-19 October. Paleoamerican Odyssey. Santa Fe, NM, USA. General information: http://paleoamericanodyssey.com/index.html

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

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

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

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

**2014**

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

## ANNOUNCEMENTS

**Opportunities for Students**

For those researchers planning to attend the Society for American Archaeology meeting in Hawaii next year, please consider applying for, or letting a student know about, the ***R. E. Taylor Award.*** As a result of a collaborative effort with the Society for American Archaeology, SAS will acknowledge an outstanding student poster for its innovative contribution in the use of scientific technologies to archaeological research by granting the award, consisting of US$100 and a one-year subscription to the SAS Bulletin. Financial support for the Taylor Award derives from the membership royalties of those who have joined us in our quest of making of archaeological sciences relevant to the study of humankind by using the tools of tomorrow. Students must submit an application via email to Destiny Crider (destiny.crider@asu.edu) by February 15, 2013 to be considered for this award. Applications in form of an email message must include the title and abstract of the poster, proof that you have registered for the SAA meetings, and proof of your status as an undergraduate or graduate student (usually appears on your SAA registration). An email confirmation that your application has been received will be sent to you.

***The Post Hole*** is a student-run not-for-profit journal based within the Department of Archaeology at the University of York. Aimed at promoting discussion and the flow of ideas within the fields of archaeology and heritage, *The Post Hole* publishes articles from a range of people, including not only academics and professionals, but also students.

Recognising the significant lack of opportunity presented to the large numbers of young archaeological scholars around the world within the realm of publishing, *The Post Hole* has endeavoured to rectify this problem by presenting a respectable and established platform from which students can also have their voices heard. This year we have begun expanding beyond the department here in York, and are now working to establish ourselves internationally in order to present this opportunity to a wider community.

Information for those interested in writing for *The Post Hole* can be obtained by visiting our website at http://theposthole.org/ or contacting Alison Tuffnell at submissions@theposthole.org. Additionally, if you are interested in working with us directly to help further our goals, please email editor@theposthole.org.

Scan the above QR Code for more on *The Post Hole.*

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***Published quarterly by the Society for Archaeological Sciences***
Distributed to subscribers: $20/yr regular membership; $15/yr student and retired; $35/yr institutional; $300 lifetime.
Individuals add $110/yr for *J. of Archaeological Science*; $40/yr each for *Archaeometry* and *Archaeological & Anthropological Sciences*. ISSN 0899-8922.