



# SAS Bulletin

*Newsletter of the Society for Archaeological Sciences*

Volume 30 number 3

Fall 2007

## Happy Birthday NAA

*Archaeometry*, one of the flagship journals of the Society for Archaeological Sciences, has recently published a special issue (Volume 29, No. 2), edited by Robert Speakman and Michael Glascock, entitled “Acknowledging Fifty Years of Neutron Activation Analysis in Archaeology.”

In 1958, *Archaeometry* (then an annual bulletin), published two articles on NAA in its first issue—just one year after the ground-breaking *American Journal of Archaeology* article, “Neutron Activation Study of Mediterranean Potsherds” by Edward Sayre and Richard Dodson, who demonstrated the technique and introduced it to archaeological audiences. And now, some 50 years later, NAA has become a standard part of many archaeologists’ toolkits for understanding the past. In their introductory article to the recent special issue, Speakman and Glascock report that, since 1958, *Archaeometry* has published more than 100 papers regarding NAA and NAA data.

Despite the introduction and development of many new analytical techniques, such as LA-ICP-MS and portable-XRF, NAA continues to be one of the most powerful (and thus influential) methods for establishing bulk chemical characterizations of a wide range of archaeological materials.

Many institutions throughout the world have contributed to this effort over the years. The special issue of *Archaeometry* documents the histories and operations of these laboratories as well as a few new programs. Speakman and Glascock estimate that, during the past 50 years, these institutions have generated more than 150,000 analyses of pottery, stone, and other materials.

In the spirit of experimentation and innovation, such as that which brought NAA to archaeology in the 1950s, in this issue of the *SAS Bulletin* Jane Entwistle and Clare Wilson describe their initial attempts at applying XRF analysis to characterize the bulk chemistry of archaeological soils from house floors, hearths, kitchen gardens, and other contexts in Perthshire, Scotland. They compare their results with those obtained from ICP-AES and discuss the potential of XRF for soil chemical assays.

Along with the contribution by Entwistle and Wilson, there are important reviews of new research and methods on metals by Thilo Rehren and on ceramics by Charlie Kolb, as well as the usual cornucopia of news on employment, awards, fellowships, conferences, and the like. Hopefully, these news items will inspire us all to innovate!

*E. Christian Wells, Editor*



Neutron Activation Analysis in archaeology celebrates its 50th birthday this year.

## In This Issue

|  |    |
|--|----|
| Employment Opportunities                             | 2  |
| Awards, Fellowships, and Training                    | 2  |
| Conference News and Announcements                    | 3  |
| Frederick R. Matson, Jr. (1912-2007) (C. C. Kolb)    | 4  |
| Humboldt Foundation (S. L. López Varela)             | 6  |
| Hydatid Cyst Disease (E. H. Kimmerle)                | 7  |
| XRF and ICP of Soil (J. A. Entwistle & C. A. Wilson) | 10 |
| Archaeometallurgy (T. Rehren)                        | 12 |
| Archaeological Ceramics (C. C. Kolb)                 | 15 |
| Book Reviews (S. N. Lengyel)                         |    |
| <i>Archaeological Computing</i> (C. C. Kolb)         | 28 |
| Upcoming Conferences (R. S. Popelka-Filcoff)         | 30 |

## Employment Opportunities

The **Department of Anthropology of Pennsylvania State University** invites applications for up to two tenure-track positions (rank flexible, effective August 2008), for individuals with expertise in the analysis and visualization of complex spatial data, especially in archaeological, paleoanthropological (including morphological), paleodemographic, and/or modern demographic contexts. Individuals from any scholarly field or sub-discipline are encouraged to apply, but the successful candidate(s) must have a record of anthropologically relevant research and teaching, publications commensurate with rank, and a demonstrated ability to attract external funding. GIS expertise is required. Specialization in spatial statistics, modeling (including traditional spatial analysis, agent-based or microsimulation techniques, and spatiotemporal approaches), remote sensing, or image analysis is highly desirable. The successful candidate(s) will develop and teach GIS courses and others that complement and augment the existing departmental curriculum, which emphasizes archaeology and bioanthropology on both graduate and undergraduate levels. They will be expected to provide leadership and vision in expanding the scope and sophistication of GIS and spatial analysis within the department and across the College, to acquire funding for innovative GIS applications, to attract graduate students, to collaborate with other department faculty, and to establish links with scholars elsewhere in the University and at other institutions. Candidates' skills and interests should be consistent with the Anthropology Department's mission, which is strongly integrative, scientific, and quantitative, and which has a long tradition of demographic, genetic, evolutionary, and ecological research both in the field and in the laboratory. Detailed information about the department is available on <http://www.anthro.psu.edu>. Review of applications will begin October 15th, 2007, and will continue until the position is filled. Interviews will commence in November 2007. Send letter of applications, c.v., and the names of three references to: Wendy Fultz, Department Staff Assistant, (wad3@psu.edu), Anthropology Faculty Search Committee, Box SAA, 414 Carpenter Building, The Pennsylvania State University, University Park, PA 16802 USA.

**Eastern New Mexico University** seeks applications for a full-time, tenure-track assistant professor of Anthropology position beginning August 2008. We seek a geoarchaeologist who also can teach lithic analysis. We prefer someone who specializes in the archaeology of the U.S. Southwest or Plains with an active research agenda. The successful candidate must be willing to run a summer field school in alternate summers. Candidates must have Ph.D. completed by August 2008. Our program has a strong graduate component, and candidates must be willing to help supervise Master's theses. Applicants should submit a letter of interest outlining qualifications, current curriculum vitae, faculty application, and names of three references to: Office of Human Resources, Eastern New Mexico University, 1500 S. Ave. K, Station #21, Portales, NM, 88130 USA. Review of applicants to begin October 29, 2007.

The **Department of Anthropology of the University of Victoria** invites applications for an appointment as Chair effective 1 July 2008. The successful candidate will be tenurable at the rank of Associate Professor or above. The new Chair will be an anthropologist with research interests related to one of the fields the Department has selected as foci: (a) health and inequality; (b) evolutionary ecology; and (c) indigenous peoples. Applications must include complete curriculum vitae and name and addresses (including email, fax and telephone numbers) of three referees whom the department may contact. Applications should be sent to: Dr. Warren Magnusson, Acting Chair, Department of Anthropology, University of Victoria, P.O. Box 3050, STN CSC, Victoria, BC V8W 3P5 Canada, before October 15, 2007.

---

## Awards, Fellowships, and Training

**Three-year PhD Studentship at the Centre for Forensic Provenancing, University of East Anglia, Norwich UK.** Title: Spatial Forensic Chemistry for Provenancing of Forensic and Archaeological Material. The Centre of Forensic Provenancing is developing spatial models for the prediction of the elemental, isotopic and biological composition of forensic materials from different environmental and geological backgrounds. The proposed PhD project is a pilot project focusing on two test areas (East Anglia and Northern Spain) where spatial soil chemistry data (elemental and isotopic), mineralogical information and palynological data will be combined in one forensic and archaeological provenancing geographical information system. The project will consist of four logical phases. First the available data of the test areas will be collated in one database and some field and laboratory work will be required to augment the database with especially strontium and lead isotopic data. Secondly the data will be combined and spatial models will be applied to define unique spatial forensic domains. In the third stage the model will be challenged, assessed and validated by unknown samples. In the fourth and final stage the model will be applied to predict the geographical origin of forensic material from criminal cases and archaeological bone material from the two regions. The student will work closely together with two colleagues, one working on the extraction genetic information from the archaeological bone material and one developing non traditional isotopic markers from the soil and forensic materials from the areas under investigation. The following techniques will be used in the project: ICPMS, MC-ICPMS, IRMS, IR, XRD and palynology. The candidate is expected to have a MSc or equivalent degree in geo- and/or environmental- chemistry or (forensic) archaeology. At the moment funding is available for a UK Citizen or Resident but others are encouraged to respond too as additional individual funding might be obtained. More information at <http://www1.uea.ac.uk/cm/home/schools/sci/cap/courses/post/studentships>. For specific information contact Jurian Hoogewerff at [J.Hoogewerff@uea.ac.uk](mailto:J.Hoogewerff@uea.ac.uk).

**Northwest Research Obsidian Studies Laboratory Annual Laboratory Grant.** If you are a university graduate student (Master's or Ph.D. level in any state or country) and your thesis or dissertation research concerns an Oregon, Idaho, or Washington archaeological project, you are eligible for our annual laboratory research grant. This grant is good for up to \$1000 worth of obsidian characterization and/or hydration studies carried out at the lab (computed at our present price rate). Laboratory analytical services include the trace element characterization, source identification, and hydration analysis of obsidian artifacts and XRF analysis of geologic source material. The grantee gets to decide how to mix or match the different types of analytical work. Should more than one applicant be selected, the lab grant will be awarded for each successful applicant at a percentage to be determined by Northwest Research Obsidian Studies Laboratory. The 2008 grant deadline application is May 31, 2008. To apply, send the lab a brief proposal concerning your obsidian-related research. The proposal should run no longer than about two pages (if we have questions, we'll ask). We will review all applications and will announce the winner(s) by June 15, 2008. For more information, see <http://www.obsidianlab.com/grant.html>.

**2008 R. E. Taylor & SAS Student Poster Awards.** The Society for Archaeological Sciences presents awards for outstanding student posters in archaeometry. These awards will be made at the 73rd Annual Meeting of the Society for American Archaeology in Vancouver, Canada, and the 37th International Symposium on Archaeometry in Siena, Italy. Formal calls for applications will be issued on the SAS website and over SASnet and other listserves prior to the conference dates. Students must submit an application in order to be considered for these awards. Multiple awards may be given, depending of the quality of entries. Prizes include a one-year membership in the SAS (with the quarterly *SAS Bulletin*) and a cash award of \$100. The student must be the first author and presenter of the poster. Criteria for the award are significance of the archaeological problem, appropriateness of the archaeometric methods used, soundness of conclusions, quality of the poster display, and oral presentation of the poster. To apply, send a copy of the poster abstract (indicating the student author), a correspondence address, and the name and date of the session in which the poster will be presented. Entry Collection/Contact: AJ Vonarx, SAS Membership Development, [ajvonarx@email.arizona.edu](mailto:ajvonarx@email.arizona.edu), University of Arizona, Department of Anthropology, 1009 E South Campus Drive, Building #30A, Tucson, Arizona USA 85721-0030.

---

## Conference News and Announcements

The **Fifth New World Luminescence Dating and Dosimetry Workshop** will be held at the Department of Earth and Environmental Sciences at the University of Illinois at Chicago. Workshop presentations are planned for October 13 to 14, 2007 (Saturday and Sunday). This workshop will gather

a diverse group of researchers in Quaternary geology, geomorphology, archaeology, luminescence geochronology, solid-state physics and geochemistry to discuss advances in optical dating and dosimetry. Presentations on the application of techniques, method development, associated physics, and broader geochronological and dosimetric implications are welcome. All presentations will be oral. We anticipate two days of presentations and some time for enjoying the University of Illinois campus and the surrounding city. The registration fee will be \$100 for professional and \$50 for students. Lunch will be provided and refreshments. Abstract deadline is September 1, 2007. Please direct your questions to Steve Forman (email: [slf@uic.edu](mailto:slf@uic.edu)).

The **3rd Annual Southeast Conference on Mesoamerican Archaeology and Ethnohistory** will take place on October 26-27, 2007 at the University of South Carolina, Columbia. This meeting aims to showcase current archaeological and ethnohistorical research in Mesoamerica with the greater goal of encouraging productive discussion, communication, and interaction among scholars. We invite Mesoamerican archaeologists, bioarchaeologists, art historians, and ethnohistorians resident in the Southeastern United States to discuss their active investigations of Pre-Columbian and early colonial Mesoamerican societies. The event is free and open to the public, and there is no registration fee. Students are encouraged to attend. For further information, visit the website, <http://uweb.cas.usf.edu/~cswells/SECMAE.htm>, or contact Laura Cahue, Department of Anthropology, University of South Carolina, Hamilton College, Room 317, Columbia, SC 29208 USA, phone: (803)777-2957, fax: (803)777-0259, e-mail: [cahue@sc.edu](mailto:cahue@sc.edu).

**Analytical Applications in the Archaeology of Eastern North America.** Planned Session for the 74th Annual Meeting of the Eastern States Archaeological Federation, November 8-11, 2007, Burlington, Vermont. The Archaeometry Laboratory at the University of Missouri Research Reactor is soliciting papers for a session at the 74th Annual Meeting of the Eastern States Archaeological Federation (ESAF) to be held in Burlington, Vermont, November 8-11, 2007. The planned session will highlight recent analyses of archaeological materials from eastern North America, and will provide a venue for presenting new research involving archaeometry, computer applications, geoarchaeology, and other methods used to advance our knowledge of past cultures. Please submit a title and short abstract (200-250 words maximum) by August 1, 2007. Submissions and requests for additional information should be directed to Matthew Boulanger at the Archaeometry Laboratory ([boulangerm@missouri.edu](mailto:boulangerm@missouri.edu)). Additional information on the 74th Annual ESAF meeting can be found on the Web site of the Eastern States Archaeological Federation (<http://esaf-archeology.org/>).

The **37th Annual International Symposium on Archaeometry** will be held in Siena, Italy, May 12-16, 2008. The Symposium will be held at the Complesso Didattico del Laterino, situated just out of the historic city walls, near to the

Dipartimento di Scienze della Terra and to the historic center of the city. The aim of the Symposium is to promote the development and use of scientific techniques in order to extract archaeological and historical information from the cultural heritage and the paleoenvironment. It involves all Natural Sciences and all types of objects and materials related with human activity. In general, papers should deal with the development and/or application of scientific techniques for extracting information related to human activities of the past, including the biological nature of man himself and the environment in which he lived. Key Dates: deadline for submission of abstracts is December 15th, 2007; notification of acceptance or rejection is January 30th, 2008; deadline for registration and payment of regular registration fee is March 1st, 2008; deadline for hotel reservations is March 1st, 2008. For more information, visit the website, <http://www.unisi.it/eventi/isa2008/index.htm>.

---

## Frederick Rognald Matson, Jr. (1912-2007)

*Charles C. Kolb*  
*Division of Preservation and Access,*  
*National Endowment for the Humanities*

Frederick R. Matson, Research Professor Emeritus of Archaeology in The College of the Liberal Arts at The Pennsylvania State University and Emeritus Professor of Ceramics in the College of Earth and Mineral Sciences at Penn State, passed on March 27, 2007 at the age of 94. A ceramic engineer, archeometrician, ceramic ethnoarchaeologist, and ethnographer of village pottery production, Matson received his B.S. in Ceramic Engineering from the University of Illinois in 1933 and was a graduate student in Ceramic Engineering at the Carnegie Institute of Technology from 1933-1934 prior to transferring to the University of Michigan where he held a graduate fellowship from 1934-1936 and earned an M.A. in Anthropology in 1936. He then enrolled in a new, unique graduate program in Ceramic Archaeology at Michigan which combined engineering (today's materials science) and archaeology; he received his doctorate in 1939. He was Field Archaeologist on the University of Michigan's Expedition to Seleucia on the Tigris [Iraq] (1936-1937) and Research Assistant in the university's Museum of Anthropology (1937-1938). In 1937 Carl Guthe asked Matson to establish a laboratory for the analysis of materials deposited in the recently formed "Ceramic Repository for the Eastern United States." In this context, he worked with the late Jimmy Griffin. Matson was a Rackham Predoctoral Fellow (1938-1939) while completing his dissertation, *A Technological Study of the Unglazed Pottery and Figurines from Seleucia on the Tigris* (April 21, 1939).

Upon graduation, he became Assistant Curator of Ceramics in the Museum of Anthropology, a position he held until 1942. With the United States' entry into World War II, he joined the Optical Glass Section of the National Bureau of Standards (now



Frederick R. Matson, Jr., 1912-2007

NIST) as Assistant Ceramic Engineer (1942-1944) and then moved to the Armstrong Cork Company's Research Laboratory in Lancaster, Pennsylvania as Head of the Glass Section (1944-1948) where optical research for the military was underway. He came to Penn State on August 1, 1948 as Professor of Ceramics in the College of Mineral Industries and became Professor of Archaeology in the Department of Sociology and Anthropology in the College of the Liberal Arts in 1953 and would remain at Penn State until his "retirement" on July 1, 1978. With Maurice Mook, a Quaker cultural anthropologist and Amish specialist, he established the anthropology program and it would become a separate department in 1965 with six faculty members. Matson also served as Assistant Dean for Research in The College of The Liberal Arts and the Administrative Director of Penn State Social Science Research Center (1957-1969).

Matson's research included studies of Mediterranean and Near Eastern ceramics from the Neolithic through the Late Islamic periods as well as ethnoarchaeological studies of contemporary village potters. His chief field and laboratory research focused on the technologies of production and compositions of ancient glazes and glass, and ceramic typologies founded on absolute chronologies (radiocarbon dating) and the analysis of archaeological and contemporary village pottery and the raw clays from which these were fabricated. Matson began to formulate the concept of Ceramic Ecology while working in the Near East. He was an early associate of the late Robert and Linda Braidwood on the Iraq-Jarmo Project of the Oriental Institute of the University of Chicago, and worked with Robert Dyson on the University of Pennsylvania's Expedition to Hasanlu in Azerbaijan. Other summer field season and sabbatical archaeological research was conducted, in the main, in Syria, Turkey, Lebanon, and Jordan, and he also did ethnographic and ethnoarchaeological research in Greece, Crete, Egypt, Sudan, Ethiopia, Spain, Iran, and Afghanistan.

Matson also played a role in the founding of the Society for American Archaeology and served in many capacities as a committee member and board member of the Archaeological Institute of America. He was the 1953 American Ceramic Society's Edward Orton, Jr. Memorial Lecturer and spoke about "Ceramic Archaeology." The lecture was published in the *ACS Bulletin* in 1955. He served as president of the

Archaeological Institute of America (1975-1976), was the founder of the AIA's Central Pennsylvania Chapter, and a founding member of the Norton Society. In 1981 Matson received the AIA's Pomerance Award for Scientific Contributions to Archaeology. This distinguished award, given only on special occasions, isn't restricted to members of the AIA. Candidates for the medal are sought internationally with no geographical limitations; the recipient may be a professional or amateur scientist, or a team, whose interdisciplinary work with archaeologists' merits recognition. The Frederick R. and Margaret B. Matson Lectures in Near Eastern Archaeology and World Archaeological Technology was established in 1997 by a generous gift from the Professors Matson who were lifelong friends and benefactors of the AIA. In 1995 he received the Society for American Archaeology's Award for Excellence in Ceramic Studies. The citation read: "In recognition of a distinguished career in which he pioneered new approaches to understanding the past through the analysis of Ceramic Ecology. Throughout a long and distinguished career, Frederick Matson has played a key role in expanding the scope of the study of ceramics by demonstrating how much can be learned by placing ceramics within an ecological context and by examining the influence of culture and environment on ceramic variation. His pioneering work, *Ceramics and Man* [1965], laid the foundation for a new era of research. His own studies of pottery from a wide geographical area—Michigan to Syria—have provided excellent models for others."

Edited by Matson, *Ceramics and Man* remains a seminal work on the analysis of cultural and environmental influences on ancient pottery. His co-contributors included an international group of scholars of ancient pottery (Ehrich, Linné, Foster, Shepard, Rouse, Griffin, Hodges, Trachsler, Balfet, Iskander, Weinberg, Mellaart, Amiran, Vanden Berghe, and Solheim). Matson's own chapter, "Ceramic Ecology: An approach to the study of early culture of the Near East," (1965:202-217) has influenced several generations of students of ceramics. The concept has been expanded by Dean E. Arnold (Wheaton College, IL) and by two of Matson's own students, Prudence Rice (Southern Illinois University) and Charles C. Kolb. In 1985 the late Louana M. Lackey (Maryland Institute College of Art) and Kolb conceived a symposium, "Ceramic Ecology: Current Research on Ceramics," that has been held for 21 years at the annual meetings of the American Anthropological Association. Fred Matson served as the discussant for the inaugural meeting. The papers in this international and interdisciplinary symposium reflect a number of approaches within the framework of Matson's concept of Ceramic Ecology and provide a forum for the exchange of ideas between Old and New World students of ceramics who range from art historians and professional potters to ethnoarchaeologists and archaeometricians.

Matson also founded and provided the initial financial support for Penn State's anthropology museum, which was designed to serve the general public and students and faculty, and he personally donated many of the objects in the Near Eastern and ethnographic ceramic collections. Renamed in

his honor, the Matson Museum of Anthropology is located on the second floor of the Carpenter Building, which is situated in the northwest corner of the Penn State University Park Campus, near the Nittany Lion Shrine; see [http://www.anthro.psu.edu/mat\\_mus/index.htm](http://www.anthro.psu.edu/mat_mus/index.htm). The Anthropology Department's publication series also bears the Matson Museum's name.

After a more than a decade of retirement, Fred and his wife, Margaret Hart Benson Matson (1913-2005), a Penn State Ph.D. (1953), left Penn State and their lovely home at 723 North Jackson Street and relocated to Baltimore, Maryland to be closer to family members. Margaret, whose academic discipline was Social Work, professed in the Penn State Sociology Department and was department head on more than once occasion. She also served for many years on academic accreditation teams for the Middle States Commission on Higher Education and enjoyed accompanying Fred on his travels. Their departure precipitated the awarding of the Penn State Alumni Association's Lion's Paw Medal in 1992 to Frederick R. Matson and Margaret B. Matson. The stated purpose of the award is "to promote the welfare and best interests and to maintain and perpetuate the traditions of The Pennsylvania State University. The medal is awarded to persons who have contributed notable service to the University. It is not awarded posthumously, nor does it honor notable gifts to the University. Neither has the medal been awarded to an employee of the University who has simply done his or her job, albeit exceptionally well. The medal, rather, honors those individuals who have contributed their time and efforts in service to the University above and beyond what is normally expected. Many of these individuals have contributed whole lives of service to better the lives of students, to enhance the quality of education at the University, and to foster the traditions of Penn State."

Margaret passed away in February 2005. Although they had no children, the Matson's built a legacy at Penn State that endures. They often entertained students in their home, and being able to see his personal library and the ethnographic and folk artifacts they had collected during their travels frequently resulted in the telling of engaging and spellbinding stories (accompanied by Fred's famous martinis). Fred's own legacy lies in his conception of Ceramic Ecology, the absolute necessity for inter- and multidisciplinary research, and the use of the ecological approach to integrate technological analyses and sociocultural interpretations. To some students and faculty he was an imposing figure – usually dressed in a three-piece British-made suit – and was addressed as Dr. or Professor, but he was a gentle man and gentleman, precise, meticulous, and never without a notepad and pencil for jotting down ideas and bibliographic citations. His students included the late Bob Johnston, Pru Rice, Jim Sheehy, the late Louana Lackey, and Charlie Kolb all of whose research and scholarship benefited from Fred's mentoring. We learned laboratory procedures, thin section preparation, petrographic microscopy, and point counting under his tutelage. I first met "Dr. Matson" in 1960 when I was an undergraduate student and I had the pleasure of being his research or teaching assistant for five years (1962-1966).



Our research in those days focused on the analysis of raw clays and archaeological ceramics from Jarmo and shell tempered Fort Ancient pottery. Fred served on my dissertation committee (chaired by Bill Sanders) and as my best man when I wed P. Jean Drew, M.D. We shall miss both Margaret and Fred. And Penn State football and neighbor, Joe Paterno, have lost devoted fans.

Two festschrifts were published in his honor: *Pots and Potters: Current Approaches in Ceramic Archaeology* (Prudence M. Rice, ed., Monograph 24, Los Angeles: Institute of Archaeology, University of California at Los Angeles, 1984), and *A Pot for All Reasons: Ceramic Ecology Revisited* (Kolb and Lackey, eds., Philadelphia: Laboratory of Anthropology, Temple University, 1988). Additional information may be found in two chapters by Kolb: "Frederick R. Matson: A Professional and Personal View" (1988:1-23) and "Selected Bibliography: Frederick R. Matson" (1988:23-37), both in *A Pot for All Reasons*.

---

### **The Alexander von Humboldt Foundation: An Excellent Opportunity for Research in Germany**

*Sandra L. López Varela*

*Department of Anthropology,*

*Universidad Autónoma del Estado de Morelos, México*

The Alexander von Humboldt Foundation (AvH) is a non-profit organization established by the Federal Republic of Germany for the promotion of international research cooperation. Currently, Prof. Dr. Wolfgang Frühwald is the first humanities scholar to hold the presidency of the Alexander von Humboldt Foundation. Previously, Werner Heisenberg, Nobel Prize for Physics in 1932; Feodor Lynen, Nobel Prize for Medicine in 1964; and Reimar Lüst, once Director General of the European Space Agency (ESA) have presided over the Foundation.

The Foundation was established in Berlin in 1860, shortly after the death of Alexander von Humboldt (1769-1859), a remarkable researcher, explorer, and patron of excellent scientific talents. Since 1953, the Foundation has enabled more than 20,000 highly qualified scholars from over 125 countries, including 40 Nobel Prize Winners, to conduct research stays in Germany. The Humboldt Foundation's annual budget is approximately 60 million Euros, 97 percent of which is financed by the German Federation. The Foundation offers the possibility of doing research in all disciplines at more than 300 institutions of higher education, 80 Max Planck Institutes, 57 Fraunhofer Institutes, 15 Helmholtz Institutes, and 84 institutes of the Leibniz Association.

Academic excellence is the premier criterion for selecting new Humboldtians. The selection committees, composed of academic experts in all subjects, make their decisions

independently and solely on the basis of the applicants' academic quality. The selection committee evaluates the applications, submitted against the background of international competition, on the basis of the documentation provided and independent reviews, regardless of country or discipline. Application forms can be downloaded from the Internet ([www.avh.de](http://www.avh.de)) and may be submitted to the Humboldt Foundation at any time. The selection committee meets three times a year. The procedure takes a total of 3-6 months from submission to notification of the committee's decision immediately after the meeting.

The Foundation grants annually: 600 *research fellowships* to highly qualified foreign scientists and scholars holding doctorates and aged up to 40 years for 6 to 12 months research stays in Germany; 60 *Georg Forster Research Fellowships* to highly qualified scientists and scholars from developing countries aged up to 45 years, for 6 to 12 months research stays in Germany; 100 *research awards* to internationally recognized scientists and scholars from abroad; 20 *Friedrich Wilhelm Bessel Research Awards* to outstanding scientists and scholars resident outside Germany and aged up to 45 years in recognition of their outstanding accomplishments in research to date and their exceptional promise for the future. The award-winners are also invited to work on research projects of their own choice in cooperation with colleagues in Germany for periods of between six months and one year. The award amounts to 45,000 EUR. *Sofja Kovalevskaja Awards* to scientists and scholars from abroad with outstanding research records, aged up to 35 years, for establishing their own working groups for long term research; 150 *Feodor Lynen Research Fellowships* to highly qualified German scientists and scholars holding doctorates and aged up to 38 years, for long-term research stays abroad; 2 *Max Planck Research Awards* to a German and a foreign academic for international cooperation; 10 *German Chancellor Scholarships* each for prospective



The late German Bundespräsident Johannes Rau during his visit to Mexico discussing the relevance of archaeology and anthropology with Sandra López Varela.

leaders from China, the Russian Federation and the USA; Subsidies towards German-American and/or Canadian academic research cooperations in the humanities, social sciences, economics and law under the *TransCoop Programme*, the Konrad Adenauer Research Award for Canadian scholars in the humanities and social sciences.

On a personal note, I can only remark how special it is to be a Humboldtian. During my postdoctoral research stay in Germany (1996-1998), I had the opportunity to do research with outstanding scientists from the Universität Bonn, the Max Planck Institut in Heidelberg, the Frei Universität Berlin, Leiden University, and Warsaw University. Once a Humboldtian, always an Humboldtian. Under this premise, I have returned to Germany, sponsored by the Foundation, to attend conferences and further research stays. Most rewarding to me has been the many opportunities I have had to demonstrate the potential of being part of this prestigious network of scientists for foreign cultural policy, anthropological research, and development cooperation between Mexico and Germany. Based on my own experience, I can only invite you to visit their website and apply to one of their numerous programs.

---

## Hydatid Cyst Disease in the Archaeological Record

*Erin H. Kimmerle*  
*Department of Anthropology,*  
*University of South Florida*

Physical markers evident in the skeletal remains of one protohistoric Northern Plains site (Sully Site, North Dakota, 39SL4) reveals evidence of hydatid cyst disease, *Echinococcus granulosus*. Understanding the pathoecology of this disease in the archaeological record provides insight into the activities and health of early Plains groups. This case is interpreted in the context of understanding the location and spread of *Echinococcus granulosus* in American antiquity and demonstrates the value paleoparasitology brings to interpreting the archaeological record. The field of paleoparasitology is growing as methods, techniques, and interest in mummy and soil studies is increasing (e.g., Araujo 1998).

The Arikara Indians migrated to South Dakota from Nebraska ca. 1500. Estimates on the number of Arikara villages range from 18 to 32 with an estimated maximum population of 30,000 people (Swagerty 1988). They lived in sedentary villages and practiced maize agriculture and other types of horticulture, relying heavily on bison. The American Fur Trade has been credited for the Arikara's political and economic power in the Upper Great Plains prior to devastating smallpox epidemics (Swagerty 1988).

The increasing presence of Euro-American traders and settlers significantly affected Arikara morbidity and mortality. For example, it is estimated that 19th Century outbreaks of

smallpox reduced the population by as much as 75 percent (Owsley 1992). Survivors united together into only three villages. Despite this, the Arikara continued to play a crucial role in the fur trade and served as "middlemen" between Euro-American traders and other indigenous populations (Swagerty 1988).

Understanding the settlement patterns, village size and density, sanitation, and disposal of waste is important for reconstructing daily activities and understanding the presence of disease and spread of parasites. By A.D. 1640, horses were present on the Great Plains and were critical in the trade network but further served to increase the spread of infectious disease and inter-tribal raiding (Owsley 1992; Ramenofsky 1989). The archaeological evidence of hydatid cyst disease provides insight into the activities and lifestyle of early Plains groups and additionally suggests the presence of domestic dogs among the protohistoric Arikara.

### *Materials and Methods*

The prevalence of nutritional and parasitic disease among the Arikara at the Sully Site (39SL4), is reconstructed based on ethno-historical data and the biological analysis of human skeletal remains. The Sully materials were brought to the Anthropology Department of the National Museum of Natural History, Smithsonian Institution, in Washington, D.C. (NMNH) following excavations from 1956-62 by Dr. William M. Bass as part of the River Basin Survey Project that worked to salvage the remains as they were being washed away due to flooding and erosion. The entire collection of Sully cemetery materials contains a total of 566 burials. The Sully site, 39SL4, consists of three cemeteries known as burial areas A, B, and D. All of the burials were primary interments, deposited in the supine, extended position, with excellent preservation, and therefore recovery was very complete. Cemetery D is affiliated with the Extended Coalescent period, dating A.D. 1550-1650, while cemeteries A and B are part of the post-contact period, which date later at A.D. 1650-1750. It should be noted, that cranial metric analysis from the each of the burial areas in the Sully site were analyzed by Jantz (1977), who found that individuals from all three cemeteries had a close biological affiliation.

The skeletal remains described here were first inventoried to provide a detailed record of the elements present and the condition of the skeletal remains. A complete paleopathology assessment for the entire Sully collection was completed as part of the documentation protocol necessary for the Repatriation Office at NMNH (Cleaves and Kimmerle 1996). Observations were made on the age at death, sex, trauma, and pathology of each individual, employing the standard protocols described by Buikstra and Ubelaker (1994) and as established by the Repatriation Office on file at the museum. Adults are defined as equal to or greater than 15 years. Each skeletal element was systematically examined and documented. Documentation of pathology mainly consisted of dichotomous coding (present/absent), using *Paradox for DOS*. Radiographic study was also completed for each cranium,

maxilla, mandible, left tibia and femora, and pathological specimens when necessary.

### Results

Overall, the skeletal materials were very complete and well preserved. Burials consist of nearly complete skeletal remains of single individuals to isolated fragments in some cases. The minimum number of individuals analyzed (n=169) includes 38 males, 35 females, and 96 adult and sub-adult individuals of indeterminate sex (73 of whom are juveniles).

Ninety-six adult crania were examined. No skeletal changes indicative of nutritional or metabolic diseases were observed. Non-specific ectocranial porosis is present in six cases. While the exact cause of this condition is poorly understood, it is often attributed to scalp infections, poor hygienic conditions, and lice infestations.

Evidence of parasites includes one case of hydatid cyst disease, indicative of a tapeworm infection, associated with a 45-50 year old male. Abnormal bone formation is visible on the scapulae (shoulder blades) and femora (upper legs). The skeletal changes on the scapula may be related to the hydatid cyst, a similar type of case is illustrated in Ortner and Putschar (1991:230). Furthermore, osteoarthritis is visible in joints throughout this skeleton.

### Pathoecology of Hydatid Cyst Disease

The definitive hosts of *Echinococcus* are dogs while intermediate hosts other commonly domesticated animals such as cattle as well as humans. Ortner and Putschar (1981) point out that this disease is of particular interest to archaeologists since it is indicative of domesticated animals and causes significant health problems including death. The *Echinococcus* life cycle begins with the passing of brood capsules through carnivore feces (Soulsby 1982:119-127). In dogs, the small intestine is the most common area of infection, however, this condition is usually nonpathogenic (Soulsby 1982:119-127).

Most commonly, the hand-to-mouth transfer of tapeworm eggs in dog feces is the mode of transmission. The larvae enter the intestines of the intermediate host and are carried to various organs (Thompson and Lymbery 1995). At this point, the larva produce cysts and infectious protoscolices develop. The larva encysts within the first week of ingestion. The cyst grows to about 1 cm in diameter within five months but is generally considered slow growing (Thompson and Lymbery 1995).

The incubation period ranges from months to years. Importantly, transmission is not possible from person-to-person. Typically, dogs pass eggs after seven weeks of incubation (Thompson and Lymbery 1995). Some research has also suggested that insects such as flies may carry eggs long distances (Lawson and Gemmell 1985). If no re-infection develops, the cycle ends in approximately one year (Thompson and Lymbery 1995). Possible treatment in antiquity is unknown.

The adult *Echinococcus granulosus* tapeworm is 2-7 mm long, consisting of 3-4 segments. A hydatid cyst is generally 5-10 cm in diameter, however, it may grow up to 50 cm in diameter. Ortner and Putschar (1981) describe the size as ranging from that of a pigeon egg to a human skull, growing larger as the cyst fills with fluid. It is the larval stage of the tapeworm, *Enchoniococcus*, which produces Hydatid cyst disease in humans. Pathogenesis may include infection in the space surrounding the cyst, impaired respiratory function, ruptured cysts result in anaphylaxis, or the spontaneous fractures of long bones (Thompson and Lymbery 1995).

Skeletal involvement is present in 2 percent of cases reported by Ortner and Putschar (1981). Cysts remain viable or die and calcify. Cysts in modern people are detected through radiographic analysis. In the archaeological record, the calcified hydatid cyst may be recovered with skeletal remains upon excavation. However, the calcified tissue is fragile and may be easily broken or missed.

The symptoms of hydatid cyst disease depend on the size, site, and pressure of the cyst on surrounding tissues (Ortner and Putschar 1981). Cysts may become infectious and rupture, releasing "daughter cysts" resulting in a secondary hydatidosis or in fatal anaphylaxis (Foroulis et al. 2003).

In terms of an epidemiological significance, humans are often infected by ingesting dog fecal contaminated fruits, vegetables, and soil or from handling dogs (Williams 1985). Risk of the spread of hydatid cyst disease increases with the association with stray dogs and poor sanitary conditions.

### Differential Diagnosis

So, is any spherical, hallow, calcified structure a hydatid cyst (Figure 1)? No, not necessarily. Dystrophic calcification of necrotic tissue may result in calcification with a similar appearance from a variety of causes. Around the periphery, the blood supply is cut off due to vascular obstruction (Ortner and Putschar 1981). Consequently, the central necrotic mass



Figure 1. Ossified thyroid cartilage recovered with the skeletal remains from an adult male at the Sully Site. Photograph taken by Jane Beck, NMNH.



remains uncalcified and decomposes postmortem that is why the cyst is hollow (Ortner and Putschar 1981). Similar appearing calcified cysts may occur from tuberculosis, tumors, and pulmonary or fungal infections (Ortner and Putschar 1981). The key to an accurate differential diagnosis includes systematic documentation of multiple lines of evidence, including gross morphology, the location and distribution of pathology, histological analysis that may allow identification of micro-organisms, and archaeological, ethno-historic, and geographic factors.

### Discussion

The increasing presence of Euro-American traders and settlers significantly affected Arikara morbidity and mortality. While hydatid cyst disease was present in the New World prior to European contact, the cultural changes occurring after contact changed the pathoecology of parasites.

The introduction of horses on the Great Plains became important in the trade network and increased the spread of infectious disease and inter-tribal raiding. Smallpox epidemics decimated the populations and forced survivors to unite together into villages, changing the settlement and hunting patterns as well as population density and sanitation. Ultimately increasing the presence of numerous infections and parasites.

In spite of these changes, the lack of evidence for nutritional or metabolic diseases suggests good nutritional health among the Arikara interred in the cemeteries associated with the Sully site. In a review of Archaic through Woodland Arikara sites by Williams (1994:99-100), seven cases of cribra orbitalia among adults and 8 percent (6/76) of the juvenile population exhibited cribra orbitalia.

The presence of cribra orbitalia has been linked to a number of nutritional deficiencies and parasitic infections including anemia, scurvy, and rickets. The apparent stability observed in the Sully cemeteries may reflect beneficial changes in subsistence patterns during this time.

Hydatid cyst disease has occurred throughout the world during *prehistoric* and *modern* times (Ortner and Putschar 1981, Williams 1985). Williams (1985) describes evidence of hydatid cyst disease (a 25 mm calcified cyst) in the thoracic region of an adult female from North Dakota A.D. 1370 and further points out that this is a rare finding in the archaeological record since evidence only exists when the cyst dies and becomes calcified antemortem.

The example of this parasitic infection as found in the Sully site, a different Arikara site, is a special finding and illustrates the value of paleoparasitology to interpreting the archaeological record.

### Acknowledgements

This paper was first presented at the Third World Congress of Mummy Studies, in Eureka, Chile in 1998. I would like to

thank Karl Reinhard for taking interest and providing valuable comments on this case.

### References

- Araujo, A., Reinhard, K., Bastos, O. M., Costa, L. C., Pirmez, C., Iniguez, A., Vicente, A. C., Morel, C. M., and Ferreira, L. F. (1998). Paleoparasitology: Perspectives with New Techniques. *Rev Inst Med Trop Sao Paulo* 40(6):371-376.
- Buikstra, J. E., and Ubelaker, D. H., Editors (1994). *Standards for Data Collection from Human Skeletal Remains*. Research Series No. 44, Arkansas Archaeological Survey, Fayetteville.
- Cleaves J., and Kimmerle, E. H. (1996). *Documentation of Human Skeletal Remains for the Sully Site (39SL4), South Dakota*. Report on file with the Office of Repatriation, Smithsonian Institution, Washington, DC.
- Foroulis, C. N., Avgoustou, C., Konstantinou, M., and Lioulis, A. G. (2003). Chest Wall Hydatidosis as the Unique Location of the Disease: Case Report and Review of the Literature. *Canadian Journal of Infectious Diseases and Medical Microbiology* 14(3):167-169.
- Jantz, R. (1977). Craniometric Relationships of Plains Populations: Historical and Evolutionary Implications. In *Trends in Middle Missouri Prehistory*, edited by W. R. Wood. Plains Anthropologist Memoir 13 22(78): 162-176.
- Lawson, J. R., and Gemmell, M. A. (1985). The Potential Role of Blowflies in the Transmission of Taeniid Tapeworm Eggs. *Parasitology* 91(1):129-143.
- Ortner, D. J., and Putschar, W. G. J. (1981). *Identification of Pathological Conditions In Human Skeletal Remains*. Smithsonian Contributions to Anthropology No. 25. Smithsonian Institution Press, Washington, DC.
- Owsley, D. W. (1992). Demography of Prehistoric and Early Historic Northern Plains Populations. In *Disease and Demography in the Americas*, edited by J. W. Verano and D. H. Ubelaker, pp. 75-86. Smithsonian Institution Press, Washington, DC.
- Ramenofsky, A. F. (1987). *Vectors of Death: The Archaeology of European Contact*. University of New Mexico Press, Albuquerque.
- Soulsby, E. J. L. (1982). *Helminths, Arthropods and Protozoa of Domesticated Animals*. 7th edition.
- Swagerty, W. R. (1988). Indian Trade in Trans-Mississippi West to 1870. In *Handbook of North American Indians*, edited by W. E. Washburn, pp. 437-442. Smithsonian Institution, Washington, DC.
- Thompson, R. C. A., and Lymbery, A.J., Editors (1995). *Echinococcus and Hydatid Disease*. CAB International, London, UK.
- Trimble, M. K. (1994). The 1837-38 Smallpox Epidemic on the Upper Missouri. In *Skeletal Biology in the Great Plains: Migration, Warfare, Health, and Subsistence*, edited by D. W. Owsley and R. Jantz, pp. 81-90. Smithsonian Institution Press, Washington, DC.
- Williams, J. A. (1985). Evidence of Hydatid Disease in a Plains Woodland Burial. *Plains Anthropologist* 30(107):25-28.

## A Comparison of XRF and Nitric-Extraction/ICP-AES for Differentiating and Interpreting Soils from an Abandoned Rural Township in Perthshire, Scotland

*Jane A. Entwistle*

*Northumbria University, Newcastle upon Tyne, UK  
and Clare A. Wilson*

*University of Stirling, Stirling, UK*

The choice of extraction methodology for analysis is often seen as critical (and probably rightly so) in multi-element soil studies as individual elements are retained differentially within different soil fractions. A range of approaches have been suggested, ranging from mild acid extractions (Middleton 2004; Wells 2004) to more aggressive total or pseudo total methods (Wilson et al. 2005). But what all of these methods have in common is the need for a significant input of laboratory time in extraction, associated washing and cleaning of equipment, and analysis.

We were interested to see if x-ray fluorescence spectrometry (XRF), with its minimal sample preparation requirements (samples were prepared and analyzed as pressed powders), would produce the same spatial patterns and/or interpretations as the more time-consuming extractions. Speeding up and reducing the costs associated with soil analysis

may be one way to facilitate and encourage its wider (though not uncritical) adoption by the archaeological community. XRF provides a method of determining total element concentrations and, while a total or pseudo total extraction may not be the most suitable approach in all geoarchaeological contexts, given the types of inputs and activities associated with many UK historical contexts, such aggressive extractions have been shown to be of use. Indeed, Wilson et al. (2006) found that a significant proportion of the anthropogenic signal is held in the more resistant soil fractions on UK historical abandoned farm sites.

A small comparative study of XRF and ICP (following hot nitric acid digestion) was undertaken on samples from an abandoned rural township in Perthshire, Scotland to assess the potential for 'rapid' XRF techniques in soil multi-element analyses of archaeological sites. Samples from house floors (kitchen area), hearth and byre areas, and top soil from kailyard (garden), grazed (outfield) and manured arable fields—a total of 115 samples—were digested in hot concentrated nitric acid and analysed using ICP-AES. A subset (n=10) of these samples covering each of the functional areas was analysed using XRF.

### *Results*

As one might expect, due to the differences in extraction efficiencies between the two techniques, a comparison of the two datasets (Table 1 and Figure 1) shows the correlation

Table 1. Mean element concentrations (n=10), % difference in mean relative recovery, and correlations between nitric-extraction/ICP-AES and XRF element concentrations (\*p < 0.05).

| Element   | HNO <sub>3</sub> extraction/<br>ICP mg kg <sup>-1</sup> | XRF mg<br>kg <sup>-1</sup> | % difference in mean<br>relative recovery | Pearson's Product Moment<br>Correlation Coefficient |
|-----------|---|----------------------------|---|---|
| Al        | 10901   | 58844                      | 19  | .350  |
| Fe        | 21418   | 44413                      | 48  | .564  |
| Mg        | 4331  | 16368                      | 26  | -.235   |
| Ca        | 2080  | 9432                       | 22  | -.069   |
| Na        | 50.9  | 7178                       | 0.7                                       | -.183   |
| K         | 791   | 17121                      | 5   | .144  |
| Ti        | 315   | 5198                       | 6   | -.141   |
| <b>P</b>  | <b>1261</b>   | <b>2750</b>                | <b>46</b>                                 | <b>.952*</b>  |
| <b>Mn</b> | <b>212</b>  | <b>1882</b>                | <b>11</b>                                 | <b>.836*</b>  |
| Ba        | 53.2  | 704                        | 8   | -.289   |
| Co        | 6.93  | 35.1                       | 20  | .036  |
| Cr        | 22.4  | 35.1                       | 64  | .596  |
| <b>Cu</b> | <b>33.8</b>   | <b>38.5</b>                | <b>88</b>                                 | <b>.880*</b>  |
| Ni        | 16.8  | 32.8                       | 51  | .384  |
| Sr        | 9.94  | 155                        | 6   | -.482   |
| Zn        | 48.4  | 75.8                       | 64  | .605  |
| Zr        | 2.55  | 238                        | 1   | -.266   |
| <b>La</b> | <b>17.5</b>   | <b>41.2</b>                | <b>42</b>                                 | <b>.810*</b>  |
| <b>Ce</b> | <b>33</b>   | <b>89</b>                  | <b>37</b>                                 | <b>.902*</b>  |
| <b>Sm</b> | <b>4.7</b>  | <b>7.72</b>                | <b>61</b>                                 | <b>.834*</b>  |
| <b>Pb</b> | <b>38.3</b>   | <b>58</b>                  | <b>66</b>                                 | <b>.992*</b>  |

between element concentrations is generally poor. The comparison of mean absolute concentrations also shows significant differences in mean relative recovery between the two techniques, which varies by element from between 0.7 percent for Na to 88 percent for Cu, but typically the recovery by acid digestion is less than 50 percent of the total concentration as determined by XRF.

The pattern of relative recovery between the different functional areas for some of the elements found to be anthropogenically enhanced at this site is shown in Figure 1. For P, the highest concentrations are in the byre where dung and urine have accumulated, while the highest concentrations of Pb, Cu and Zn are found in the hearth where ash from fuel materials (peat and coal) has accumulated. However, for Ca,

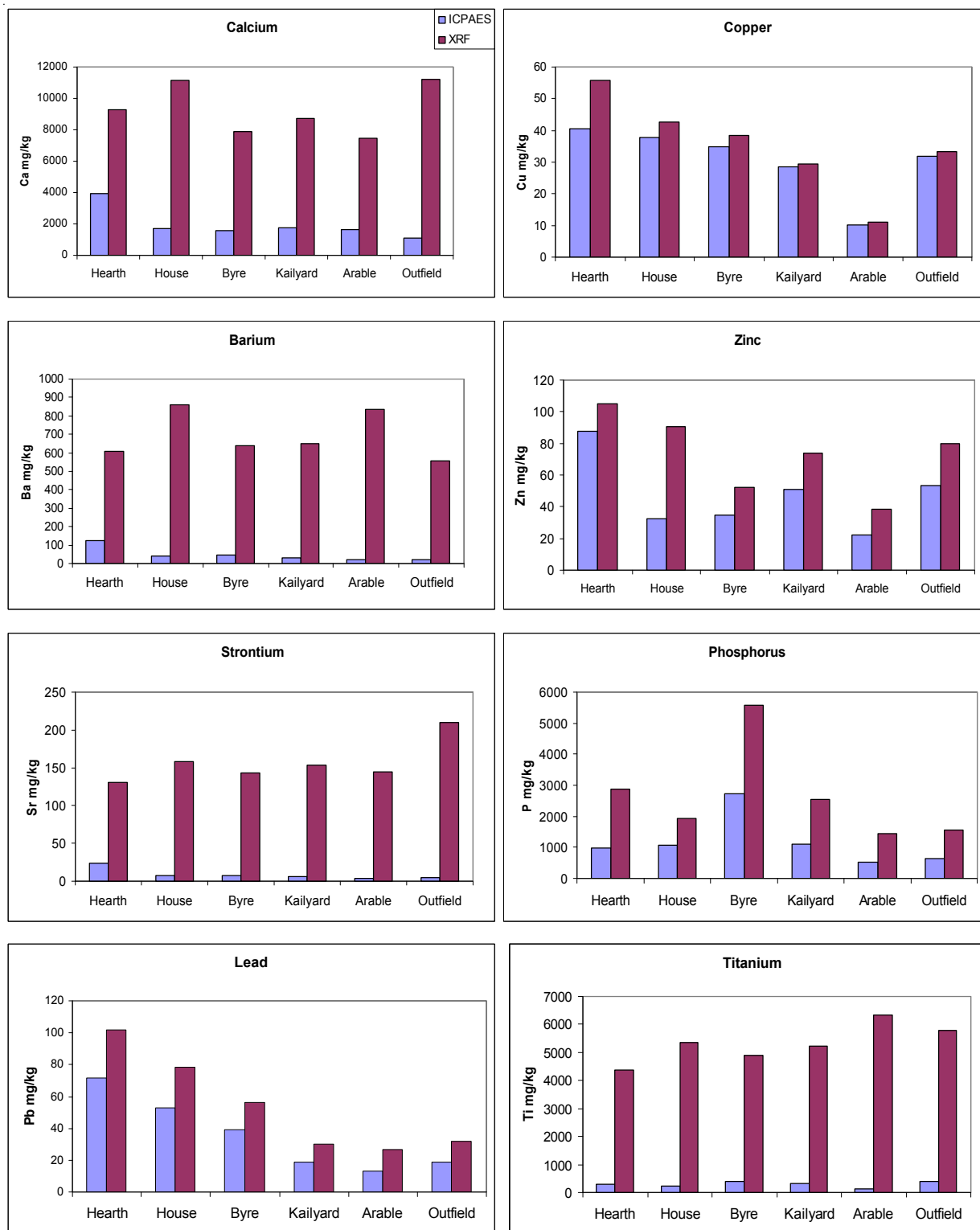


Figure 1. Mean element concentrations by functional area as recorded by nitric-extraction/ICP-AES and XRF.

Sr, and Ba there is little correlation in the pattern of enhancement between the two methods. While the acid digestion-ICP analysis shows the highest concentrations in the hearth and lower concentrations in the field areas, the XRF analysis shows less differentiation between functional areas and, in many cases, the fields contain higher concentrations detectable by XRF than the concentrations in the buildings. A similar pattern of enhancement is also shown by XRF for Ti and Zr (not shown).

### Discussion

Despite large differences in recovery between the two analytical methods there is good agreement in the pattern of enhancement for a number of elements, in particular for the REEs (La, Ce, Sm), Pb, P, Mn, Zn and Cu. These elements seem to be important for differentiating between the altered on-site and 'less' amended off-site (arable and grazed outfield) soils.

Concentrations of other elements, most notably Na, K, Ca, Ba, Sr, Zr and Ti show very poor correlation between the two methods. The pattern of enhancement of these elements as measured by XRF appears not to relate to the pattern of anthropogenic activity. ICP-AES also gave poor results for Na, K, Ti and Zr, and it has been suggested that patterns of enhancement for at least these latter two elements (Ti and Zr) are related to geological rather than anthropogenic processes (Wilson et al. 2005). However, the pattern of enhancement of Ca, Sr and Ba using acid digestion and ICP-AES at this and other similar sites has been important in discriminating between areas of different function. The enhanced soil concentrations of these elements appear to originate primarily from ash, bone, and lime based building materials.

The differences in measured concentrations of Ti and Zr suggest that these elements are bound in the soil within the most resistant mineral phases hence recovery by hot acid digestion is poor. The poor correlation between techniques for K, Na, Ca, Sr and Ba also seems to be linked with poor relative recovery by acid digestion compared to XRF. However, in this case, the hot acid digestion technique appears to be emphasising the importance of the anthropogenic chemical signature, which appears to be masked by the high "total" concentrations recorded using XRF.

For discrimination of on-site (i.e., hearth, house floor, byre, kailyard) and off-site (the grazed outfields and arable) areas it appears that both acid digestion-ICP-AES and XRF techniques work well (also see Abrahams et al., in press). For interpretation of on-site functional areas, there is good agreement in the pattern of enhancement even if there are big differences in the recovery and measured absolute concentrations for elements such as P, Pb, Cu, and even Zn. However, the findings for Ca, Sr, and Ba paint a less rosy picture, and this could negatively impact the discrimination of functional areas, though with such a small sample the effect cannot be quantified. This pilot study is now being scaled up to field scale, and is being undertaken in conjunction with a range of other novel (e.g., laser scanning,

in-situ gamma spectrometry) and more traditional analyses (e.g., geophysics) to investigate the role of topography, water movements, and other environmental variables on soil geoarchaeological findings.

### References

- Abrahams, P.W., Entwistle, J.A. and Dodgshon, R.A. (in press) The Ben Lawers Historic Landscape Project: The Simultaneous Multi-element Analysis of Former Settlement and Arable Soils by X-ray Fluorescence Spectrometry. *Journal of Archaeological Method and Theory*, forthcoming.
- Middleton, W.D. (2004). Identifying Chemical Activity Residues on Prehistoric House Floors: A Methodology and Rationale for Multi-elemental Characterization of a Mild Acid Extract of Anthropogenic Sediments. *Archaeometry* 46:47-65.
- Wells, E.C. (2004). Investigating Activity Patterns in Prehispanic Plazas: Weak Acid-Extraction ICP-AES Analysis of Anthrosols at Classic Period El Coyote, Northwestern Honduras. *Archaeometry* 46:67-84.
- Wilson, C.A., Davidson, D.A., and Cresser, M.S. (2005). An Evaluation of Multielement Analysis of Historic Soil Contamination to Differentiate Space Use and Former Function in and around Abandoned Farms. *The Holocene* 15:1094-1099.
- Wilson, C.A., Cresser, M.S. and Davidson, D.A. (2006). Sequential Element Extraction of Soils from Abandoned Farms: An Investigation of the Partitioning of Anthropogenic Element Inputs from Historic Land Use. *Journal of Environmental Monitoring* 8:439-444.

---

## Archaeometallurgy

*Thilo Rehren, Guest Associate Editor*

This column contains several recent news items relevant to archaeometallurgy, including information about upcoming and past conferences and the publication of a few Ph.D. theses.

### Upcoming Conferences

A workshop on Early Iranian Metallurgy is to take place from 19 to 21 September at the Department of Archaeology, University of Nottingham / UK, organized by Lloyd Weeks and co-sponsored by the British Academy and the British Institute of Persian Studies. Planned sessions include: Introductions and Overviews by Weeks, Vatandoust, Pernicka and Lamberg-Karlovsky; Metallurgy on the Iranian Plateau with four papers by Schreiner (Tepe Sialk), Helwing (Arisman), Thornton (Tepe Hissar), and Coningham & Fazeli (Tehran Plain); Metallurgy in SE Iran, with three papers by Giardino (Shahr-i Sokhta), Thornton (Iblis and Yahya), and Meier (Shahdad); and SW Iran and the Zagros, with seven papers by Nishiaki, Weeks, Petrie, Pigott, Benoit, Frame, and Mille. Friday



morning is reserved for reviews and informal discussions. I am not too sure about registration formalities and, as a workshop, it is probably meant to be for a limited number of participants only.

The Atilim University in Ankara is inviting papers for an International Conference on Ancient Mining in Turkey and the Eastern Mediterranean, from 15 to 21 June 2008. Conference topics include mining and quarrying sites, trade and provenancing of mining products, mining technology, smelting technology, and mining villages. The deadline for receipt of abstracts is 1 November 2007, and all details are at <http://amitem.atilim.edu.tr>, including the names and addresses for abstract submission.

### *Past Conferences*

A key event in archaeometallurgy took place from 16 to 21 June 2007 in northern Italy. The second ‘Archaeometallurgy in Europe’ conference, organized by the Italian Association of Metallurgy, brought together several hundred participants from Europe, and several more from the Americas. The organizers had managed to produce a CD with a considerable number of the papers as pre-prints, which were handed out during the conference. Few of us having their laptops at hand, it was nevertheless a good move ensuring that one could get an idea of those papers one could not listen to directly, once back home. Overall, the conference deserves to be called a success, even though a few oddities tempered the overall level of satisfaction for some of us. First of all, there were the ‘spatial issues’, with the conference venue being in Aquileia, but many delegates living in Grado, some eight kilometres away, due to insufficient hotel capacity at Aquileia. In compensation, Grado not only offered the better beaches but also the better restaurants and night life. Bus service between the two towns was good (even excellent for British standards of public transport), with several buses running in the morning and afternoon. Thus, the more serious spatial issue concerned the lecture rooms themselves. The program was such that there were three parallel sessions for Monday and Tuesday, and still two parallel sessions on Wednesday and Thursday. Fast walking distance between the main room and either of the two others was at least six minutes, and the weather was really hot! Thus, despite the good efforts of most chairpeople to keep their speakers to the published schedule it was nearly impossible to switch between sessions without missing at least one paper. Occasions when the local municipality staff locked the door to the building hosting one of the lecture rooms for lunch and failed to re-emerge for the afternoon session may be seen as local flavour, but nonetheless felt like major disruptions at the time; as did repeated problems with the technical equipment. But then, we had a nice (but pricey) reception and conference dinner, and a free classical music evening in Grado for entertainment; the harpist was really good, I’m told, and played for nearly an hour.

The opening session saw presentations by the three Conference Chairpeople. Paul Craddock presented an update on current thought about the suspicious lack of smelting

evidence in the European Bronze Age for copper production, and highlighted the size and weight of several recently discovered ‘slag heaps’ from that period: around 50 g, measured generously. Clearly, there is more work to be done to explain the origin and production technology for all those heavy metal implements and objects from that period.

Alessandra Giunlia-Mair gave a well illustrated presentation of medieval mercury production in Idrija, modern-day Slovenia, not too far away from our venue. Being second only to the famous mercury mine of Almaden in Spain, this was a major producer for a metal whose archaeometallurgy is strangely unexplored, given the many uses it has in ancient technology and medicine. The reviewer certainly was taken in by the well-preserved industrial heritage still visible in Idrija, and hopes to be able one day to see it in its original.

Andreas Hauptmann then presented a detailed analytical study of a collection of Chalcolithic mace heads recently donated to a major museum in Israel, in an attempt to ascertain their cultural date by comparing them to well-excavated similar objects. It seems likely that these objects were indeed of Chalcolithic date, and may well have been retrieved from a looted site. It is a pity that no proper excavation context of the material was available, given that it is obviously a rather recent acquisition.

He then concluded his talk by inviting the participants to the next Archaeometallurgy in Europe conference, to be held in mid-June 2011 at the Deutsches Bergbau-Museum in Bochum; he even showed us an architect’s sketch of the planned new building of the museum where the poster session will take place. Slightly odd, this felt like the closing session of the conference, which was as well since there was no closing session on the last day...

The subsequent program included some 125 oral presentations and some 65 poster presentations, but—as always at large conferences—not all the speakers were able to come. Still there is no chance to individually review even a fraction of the papers given; but it was a much more balanced mix of different metals and aspects of archaeometallurgy than at most other international conferences I have been to. Seven sessions were on copper and its alloys, three on iron, two on gold, and one on lead and silver; mining had its own session, there were two on ores, smelting processes and refractories, and another one on slags. Two sessions were dedicated to non-European metallurgy, despite the official title of the conference and a major attraction to ensure colleagues from overseas could present their work as well. Other sessions concentrated on manufacturing methods and finished objects; there was certainly something for everybody interested in archaeometallurgy. On a purely geographical breakdown, the strongest group (58) of the papers had Italian lead authors, as one would expect from an Italian-hosted conference; the next strongest group of 22 papers was led by French authors, closely followed by 20 papers from authors based in the UK. Spain (12) and Germany (10) were the next most prolific countries.

(All these figures are based on the published program rather than the actual attendance.) It is particularly encouraging to see that many papers were authored by colleagues from different countries, underlining the increasing globalization of archaeometry, and often included authors with affiliations in both science and humanities departments. Back home, the CD proved very helpful in containing a fair number of the presentations in their print-edited form, often facilitating more detailed comprehension than the oral presentation. The organizers are certainly to be commended for this service!

At the time of writing this, it is still unclear when the deadline for submitting the final manuscripts for the peer-reviewed volume will be; two weeks after the conference the organizers invited all participants to submit their final papers within a fortnight, but have since extended this deadline, for some at least, to the end of August, a slightly more realistic time frame given the current holiday season and the usual pressures most academics and students are under. Clearly, they are determined to achieve rapid publication, which is excellent news; and I am looking forward to seeing the bulk of the good presentations soon available in print, as a peer-reviewed volume.

#### *PhD Theses*

A lot of cutting-edge work in archaeometallurgy is being done as part of doctoral research. I would be very grateful for any information about past and current PhD theses, and even more so for physical copies (paper or electronic), for inclusion in the Tylecote Library at the UCL Institute of Archaeology, and in these listings.

*Material Properties of Copper Alloys Containing Arsenic, Antimony, and Bismuth – The Material of Early Bronze Age Ingot Torques*, by Margrit Junk (Technische Universität Bergakademie Freiberg, 2003). This work deals with Early Bronze Age ingot torques, their composition, and material properties. The aim was to decide whether and how a choice of materials by composition or properties was possible during the Early Bronze Age. EBA ingot torques were analyzed and artifacts from several hoard finds and working stages were investigated metallographically. On the basis of these data the production technology was reconstructed. For the determination of mechanical and technological properties, reference alloys were produced and investigated. The production process was simulated by forging experiments. The investigation revealed that ingot torques were produced by a standardized technology, independent of their composition. The results of the material testing show that it is possible to distinguish the composition of the EBA alloys by their mechanical and technological properties.

*Preindustrial Copper Production at the Archaeological Zone of Itziparátzico, a Tarascan Location in Michoacán, México*, by Blanca Maldonado (Pennsylvania State University, 2006). Mesoamerican copper metallurgy developed in West México sometime between A.D. 600 and 800, and over the next 900 years a wide variety of artifacts was produced. At the time of the Spanish Conquest the main locus of metal

production in Mesoamerica was the Tarascan region of western México. Scholars have argued that mining and metallurgy evolved into a state industry, as metal adornments used as insignias of social status and public ritual became closely associated with political control. In spite of its importance, however, Tarascan metallurgy is poorly documented. The extractive processes involved and the organization of the different aspects of this production are virtually unknown. This thesis outlines the design, implementation and results of an archaeological project carried out at Itziparátzico, a Tarascan locality near Santa Clara del Cobre, México, where evidence indicates that copper metal production took place from the Late Postclassic throughout the Contact period, and continues until today. This pioneer research has required the employment of multiple strands of evidence, including archaeological survey and excavation, ethnoarchaeology, experimental replication, and archaeometallurgy. Intensive surface survey located concentrations of manufacturing byproducts (i.e., slag) on surface that represented potential production areas. Stratigraphic excavation and subsequent archaeometallurgical analysis of physical remains have been combined with ethnohistorical and ethnoarchaeological data, as well as comparative analogy, to propose a model for prehispanic copper production among the Tarascans. The goal of this analysis is to gain insights into the nature of metal production and its role in the major state apparatus. Although small in scale, this study provides valuable insights into the development of technology and political economy in ancient Mesoamerica and offers a contribution to general anthropological theories of the emergence of social complexity.

*The Evolution of a Craft: The Use of Metal Threads in the Decoration of Late and Post Byzantine Ecclesiastical Textiles* by Anna Karatzani (UCL-Institute of Archaeology, 2007). This thesis investigates the morphological and technological characteristics of Byzantine-Greek metal threads used for the decoration of embroidered ecclesiastical textiles from the 13th to the 19th centuries AD. The research is based on the study and analytical examination of 290 metal thread samples obtained from 115 objects of Byzantine-Greek, Western European and Near Eastern origins. Optical microscopy, SEM/EDS surface and cross section analysis, and EPMA/WDS cross section analysis have been used: to identify and record the morphological and technological characteristics of the threads; to acquire quantitative information about the metal/alloys; to identify and measure the surface coatings; to measure the thickness of the strips and the diameter of wires and, finally, to identify the organic core threads. Two manufacturing techniques have been used throughout this period, strips cut from a metal sheet and drawn wires which were also rolled to produce strips. These techniques correspond to different elemental compositions; silver-copper alloys were used for cut strips and pure or almost pure silver for wires and rolled strips. Furthermore, wires have been made of better refined silver than rolled strips. A clear connection was found between the materials and techniques used in Byzantine-Greek and Ottoman metal threads which are different from the European threads throughout the period examined.

## Archaeological Ceramics

Charles C. Kolb, Associate Editor

The column in this issue includes seven topics: 1) Reviews of Books on Archaeological Ceramics; 2) Brief Reviews; 3) Previous Meetings; 4) Forthcoming Meetings; 5) Five Newsletters on Ceramics: A Status Report; 6) Exhibitions; and 7) Special Issue on *Archaeometry*.

### Reviews of Books on Archaeological Ceramics

J. Theodore Peña, *Roman Pottery in the Archaeological Record* (Cambridge and New York: Cambridge University Press, 2007. xviii + 430 pp., 12 Tables, 81 figures, 9 maps, endnotes, bibliography, two indices. ISBN 10: 0-521-86541-8, ISBN-13: 978-0-521-86541, \$95.00. Peña, Chairman of the Department of Classics at the University of Buffalo, SUNY, specializes in the archaeology of the Roman economy and ceramics. He is the director of the Palatine East Pottery Project (PEPP), an international research project concerned with the analysis and publication of the pottery assemblage recovered in the course of the Palatine East Excavations. These excavations, carried out during the period 1989-1995 as a collaborative project between the Soprintendenza Archeologica di Roma and the American Academy in Rome, under the direction of Eric Hostetter (University of Illinois), involved the investigation of late imperial *domus* (townhouse) located at the foot of the northeast slope of the Palatine Hill in downtown Rome. The ca. 20 metric tons of pottery recovered in the course of the excavations consists primarily of Roman materials dating to the period ca. 50-450 CE and post-Roman materials dating primarily to the period ca. 750-1800 CE. An Internet site at <http://www.acsu.buffalo.edu/~tpeña/> provides an overview PEPP's operations and reports some of the results that the project. He is also the author of "Raw material use among nucleated industry potters: The case of Vasanello, Italy," *Archaeomaterials* 6:93-122 (1992); "Aspects of residuality in the Palatine East pottery assemblage," in Guidobaldi, F. et al. (eds.), *I materiali residui nello scavo archeologico: Collection de l'École Française de Rome* 249:5-19, 290-91 (1998); "The mobilization of state olive oil in Roman Africa: The evidence of late 4th-c. ostraca from Carthage," in Peña, J. T., Rossiter, J. J., Wilson, A. I., Wells, C., Carroll, M., Freed, J., and Godden, D., *Carthage Papers: The Early Colony's Economy, Water Supply, a Private Bath, and the Mobilization of State Olive Oil, Journal of Roman Archaeology Supplement* 28:116-138; and *The Urban Economy during the Early Dominate: Pottery Evidence from the Palatine Hill*, British Archaeological Reports, International Series S784, Oxford: Tempvs Reparatum (1999).

*Roman Pottery in the Archaeological Record* has an "Introduction" (pp. 1-5), 11 chapters and an appendix; supplemented by 12 tables, 81 figures, 379 endnotes, and a bibliography with 486 entries. There are two indices (pp. 385-430): "Index of Ancient Texts Cited" and "General Index"; the latter is double-column, conflating proper nouns and topics, and is extremely detailed. The bibliographies include edited and

translated texts (34 in Latin, 11 in Greek, and 3 in Late Hebrew/Aramaic); among these are citations to excavations and artifacts referenced include Pompeii, Cosa, Ostia, and Monte Testaccio in Italy, Wadi Umm Hussein (Egypt), Alice Holt (United Kingdom), etc. Monte Testaccio is "pottery dump" — an artificial hill in Rome composed of pottery fragments from amphorae and diotae (liquid and grain transport containers) that was used until the end of the 4<sup>th</sup> century CE. It has a depth of 45 m and circumference of 1,017 m, with a volume calculated at 580,000 m<sup>3</sup> (Rodríguez-Almedia 1984). Brief chapter summaries follow.

In "Chapter 1: A Model of the Life Cycle of Roman Pottery" (pp. 6-16, 2 figures, 4 endnotes), Peña discusses the artifact life cycle (manufacture, use, maintenance and discard) and eight behaviors (manufacture, distribution, primary use, reuse, maintenance, recycling, discard, and reclamation) while in "Chapter 2: Background Considerations" (pp. 17-31 (6 figures, 14 endnotes), he considers four forms of evidence (textual, representational, material cultural, and comparative [archaeological]), and six functional categories of vessels. These include dolia (extremely large, fixed storage jars with 400-3,000 l. capacities), amphorae (portable jars/jugs with 6-150 l. capacities), lamps for lighting, cookwares (cooking and heating vessels), utilitarian wares (food preparation and storage functions), and tablewares (vessels for serving and consumption). His "Chapter 3: Manufacture and Distribution" (pp. 32-38, 7 endnotes) covers these two topics in six and one-half pages. The author's "Chapter 4: Prime Use" (pp. 39-60, 2 figures, 3 tables, 24 endnotes) includes discussions on behavioral uses, three loci of prime use, general aspects of vessel use life, elaborates the six functional categories and four reasons for "retiring" vessels. He writes that most Roman pottery was produced by specialized craftsmen, who employed the potter's wheel and kilns that likely reached soaking temperatures in the range of 800-1,000° C, and who distributed their wares to consumers via the market" (p. 41).

"Chapter 5: The Reuse of Amphorae as Packaging Containers" (pp. 61-118, 5 figures, 6 tables, 52 endnotes) focuses on Type A reuse (packaging the same or some different substance in the vessels), elaborates four "contents" (prime use, principal, irregular, and nonstandard), the methods of "holing" amphorae, the use of pitch lining, the importance of sand-filled amphorae as ballast, and packaging facilities. Stoppers included exotic materials such as cork and sherds in plaster, and amphora stamps and labeling. He also provides a useful list of nonstandard contents (Table 5.4, pp. 103-105) and summarizes textual evidence. In "Chapter 6: The Reuse of Amphorae for Purposes Other than as Packaging Containers" (pp. 119-192, 23 figures, 48 endnotes), Peña reviews Type B (reuse involving an application different from the vessel's prime use application without any physical modification to it), and Type C (similar to Type B, but involving physical modification). The latter involved one or more of eight operations: sawing, chipping, breaking, drilling, punching, and abrading. Type C vessels were used for a variety of foodstuffs or nonfood substances (dyes, resins, gums, etc.), but were

converted into: water jars, urinals, incense burners, grinding palettes, strainers, funnels, boundary markers, lamp covers, grinding implements, tokens, stoppers or lids, weights ostraca, ossuaries for creations, sarcophagi (adult and infant), planters, drains, and architectural elements. The reuse of dolia, cookwares, utilitarian wares, and table wares are detailed in “Chapter 7” The Reuse of the Other Functional Categories of Pottery” (pp. 193-208, 8 figures, 9 endnotes). Some dolia became ovens or furnaces, while specimens from the other vessel categories were transformed into cups, bowls, lids, and most of the same functions as defined in the previous chapter.

The upkeep or maintenance of ceramic vessels involved cleaning, resurfacing, filling or patching, and bracing. These are documented in “Chapter 8: Maintenance” (pp. 209-249, 13 figures, 1 table, 41 endnotes). In “Chapter 9: Recycling” (pp. 250-271, 5 figures, 18 endnotes), he states that “the recycling of Roman pottery involved the use of sherds, crushed pottery, or pulverized pottery as fill, fill/reagent, or tempering agent in the manufacture of a compound artifact” (p. 250). Some evidence comes from the textual documents as well as the archaeological record. Types of fill (hydrogeological, structural in pottery workshops, and concrete construction), facing (concrete construction), surfacing (pavements), and as reagents/fill (impermeable cement linings, pavements, mortar, wall plaster and plaster architectural elements, as ceramic temper [grog or chamotte], and as coloring, flavoring, and medicinals) are reviewed. Cosmetics were derived from ground [red] Sigillata. “Chapter 10: Discard and Reclamation” (pp. 272-318, 6 figures, 33 endnotes) focuses on behavioral loci (pottery workshops, wholesale/storage and retail facilities [for pottery as well as urine, oil and/or fish products]), and residences and other locales. He refers to the non-Roman ceramic ethnoarchaeological literature (notably Hayden and Cannon 1083, Deal 1985, Kamp 1991, and David and Kramer 2001:91-115), and states that for the Roman world “there has been no comprehensive study of refuse disposal ever undertaken, and that it is an important topic poorly understood” (p. 277). Peña next elaborates the Roman evidence of refuse discard at a number of archaeological sites including Wadi Umm Hussein (Egypt), Iesi (Adriatic coast of Italy), Villa Regina (near Pompeii, Italy), Alice Holt (near Silchester, United Kingdom), and Monte Testaccio in Rome. Iesi and Alice Holt had pottery workshops, Villa Regina was a residential farm villa, and Monte Testaccio was a discard area in the vicinity of a wholesale/storage and bulk retail facility.

In “Chapter 11: Modeling the Formation of the Roman Pottery Record” (pp. 319-358, 11 figures, 7 endnotes), the author relates the behavioral practices, pottery life cycles, and vessel types in a model that has seven diagrams. He also provides a typology of pottery deposits, illustrates five effects of behavioral practices on the “pottery record,” and suggests three lines of future research. The latter include: 1) detailed and comprehensive ethnographic and ethnoarchaeological research; 2) determine more precisely the approximate chronologies of large numbers of vessels; and 3) conduct research on the abrasion of slips and the deposition of soot on

cookwares. Binocular and petrographic thin-section microscopy and vessel contents analyses are also recommended. An appendix, “Amphora Classes Referred to in the Text” (pp. 353-358, 2 tables), includes a tabulation of 65 classes each with information on provenience, date range, principal content, and references. The latter frequently references Peacock and Williams (1986) and various excavation site reports.

In sum, this compelling and holistic analysis of the life of Roman-era ceramic vessels is essential reading for any investigator of ceramic materials produced in quantity in the context of large polities such as city-states. It is the most comprehensive assessment that we have of the ceramic life cycle is invaluable and should be ready by scholars and students – it is a dynamic portrayal, logically presented and very well written. New World specialists involved in Mesoamerican and Andean research would benefit from examining carefully the analyses and paradigms that Peña provides. He comments that “we know surprisingly little about these questions, and Roman pottery specialists have been, and are at present, operating on the basis of a set of unjustifiably optimistic, untested, and – to some extent – false assumptions regarding the origin and significance of patterning in pottery data, leaving open to question the significance of the results of much pottery research” (p. 1). Although the volume examines how Romans used their pottery and the implications of these practices on the archaeological record, the author explicates a flow model for the life cycle of Roman pottery that includes a set of distinct practices, how these practices operated, how they have shaped the archaeological record, and the implications of these processes on archaeological research through the examination of a wide array of archaeological, textual, representational, and comparative ethnographic evidence. The book is a worthy addition to the major literature: David Adan-Bayewitz (1993), *Common Pottery in Roman Galilee: A Study of Local Trade* (Bar-Ilan Studies in Near Eastern Language and Culture, Ramat-Gan, Israel: Bar-Ilan Press.); R. Degeest (2000), *The Common Wares of Sagalassos: Typology and Chronology* (Studies in Eastern Mediterranean Archaeology 3, Turnhout, Belgium: Brepols); D. P. S. Peacock (1982), *Pottery in the Roman World: An Ethno-archaeological Approach* (London: Longman); and D. P. S. Peacock and D. F. Williams (1986), *Amphorae and the Roman Economy: An Introductory Guide* (London and New York: Longman). Peña’s important contribution is among the best half dozen volumes that I have read in 45 years of reviewing monographs on archaeological ceramics and is a “must read.”

Jennifer Whitney Coolidge, *Southern Turkmenistan in the Neolithic: A Petrographic Case Study*, British Archaeological Reports International Series S1423, Oxford: Archaeopress, 2005, xiii + 186p, 146 figs, maps and plates, 5 appendices of data; ISBN-13: 978-1-84171-862-0, ISBN-10: 1-84171-862-9, \$90.00. The Neolithic period of southern Turkmenistan, Central Asia is the primary focus of Coolidge’s study and this monograph is based on her 2001 Oxford University dissertation. During the Neolithic, southern Turkmenia was inhabited by two main groups living in two



discrete ecological environmental zones: the agro-pastoral Jeitun Culture of the southern super-zone and the nomadic Keltiminar Culture of the northern super-zone which subsisted on hunting, gathering, and stock breeding. Southern Turkmenia also served as a corridor to steppe lands of inner Eurasia to the north and provided contact and communication networks with Mesopotamia and the Indus Valley through the Iranian Plateau. The Jeitun Culture of the Kopet Dag piedmont zone are believed to be the first agro-pastoralists of southwestern Central Asia, so that comparisons of Jeitun and Keltiminar sociocultural, economic, and demographic attributes provides valuable information on pastoral nomadism, settled agriculture, population expansion, and the advent of urbanism in southwestern Central Asia and Inner Eurasia.

The petrographic analysis of Jeitun Culture ceramic assemblages is employed to examine issues of production, distribution, and exchange, and economics in a Neolithic society. The author employed standard optical and polarizing microscopy of ceramic specimens and thin-sections, which allowed her to create a fabric classification system that permitted comparisons of regional and temporal variations within the assemblage and between the ceramic assemblages of Jeitun Culture and those from adjacent areas. A total of 1,319 specimens were analyzed. In addition, her research resulted in a description of Jeitun pottery production technology which, in turn, shed further light on Neolithic production and distribution. The provenance analysis also addressed issues of population movement, distribution, trade, and exchange during the Neolithic of Southern Turkmenistan.

The volume begins with a one-page "Introduction," and is organized into eight chapters and five appendices, supplemented by 146 figures (75 in the text and 71 in appendices), and a "Bibliography" containing 193 entries. In this study, Chapters 1-3 provide essential background needed for an accurate understanding of the typological and petrographic case studies, the insight those studies can provide to our knowledge of the structure of the Jeitun and Keltiminar Neolithic adaptations, and the notion of prehistoric Turkmenia as an archaeological border zone. "Chapter 1: Physical Environment of Central Asia" (pp. 1-6, 2 figures) contains basic information about the region's hydrology, mountains and piedmont, alluvial floodplain, and desert, as well as a summary of paleoclimates and paleohydrography. "Chapter 2: History of Archeological Investigations" (pp. 7-22, 5 figures) provides information about research conducted on the Mesolithic, Caspian Mesolithic transition to Jeitun Neolithic, the Neolithic, and pre-Namazga Aeneolithic Anau IA Period (Kopet Dag). Nine specific sets of studies on the Neolithic are reviewed. In the subsequent chapter, "Excavation Methodology and Results" (pp. 23-57, 36 figures), Coolidge characterizes five excavation regions and 20 specific excavations. The regions include: Iranian Plateau (Sang-e Caxamaq excavations); Jeitun Culture sites of the Kopet Dag central zone (excavations at Jeitun by the Soviets, Jeitun by the British, Chopan, Togolok, Pessedjik, New Nisa, and Gievdzhik); Jeitun Culture sites in the Meana-Chaacha district/Kopet Dag eastern zone (excavations at Chaaglyly,

Chakmakli, Monjukli, and Gadeim); Jeitun Culture site in the Kopet Dag western zone (excavations at Bami); and Keltiminar and Keltiminar-related sites (excavations on the Lower Amu Darya and Akcha Darya Delta (Djanbas); The Zerviahan, Ayakagitma, Daryasai, and Markandarya; Lake Lyavlyakan and Inner Kyzyl Kum; Uzboi River, north Pribalkhan, and south Pribalkhan; and three separate sites in the Bolshoi Balkjan Mountains).

The ceramic assemblages for the petrographic case study are initially introduced in the context of "Chapter 4: Ceramic Typology" (pp. 59-84, 21 figures). Ceramic forms and decoration are documented for Jeitun Culture Phases IA, IB, 2, and 3, followed by a review of ceramic assemblages from 18 sites. Vessel forms and functions, statistical analyses, and the identification of three research questions are also presented. The latter include: fabric classification, production technologies, and provenancing. "Chapter 5: Introduction to Petrography" (pp. 85-88), documents the research methodology employed in this analysis. In "Chapter 6: The Kopet Dag Case Study" (pp. 89-110, 10 figures) addresses research aims and questions (fabric classification, production technologies, provenancing, and geological predictions for the western, central, and eastern zones); methodologies (sample selection, cataloging, and thin section analysis); and results. The latter provides a summary of the classification of fabrics, technological assessments (collection and preparation of the raw materials, preparation of the ceramic paste, vessel forming and drying, surface treatments, firing, tempers, and vessel repairs), and determination of provenance. A brief "Chapter 7: Synthesis and Interpretation" (pp. 111-115), considers the statistical analyses, the ceramic assemblages, production mode, distribution and exchange, and a summary of the Jeitun Neolithic. Lastly, "Chapter 8: Neolithic Contrasts and Comparisons" (pp. 117-124, 1 figure), focuses on Southern Turkmenia as an archaeological "border zone", Jeitun Culture as a semi-sedentary adaptation, relationships with Iran and Afghanistan, Jeitun relations with the Keltiminar, and suggestions for future research.

The five appendices provide valuable information: Appendix I: Glossary" (pp. 125-128) contains 91 terms; "Appendix 2: Ceramic Typology" (pp. 129-147, 71 figures) has essential illustrations derived from the literature; "Appendix 3: Fabric Classification Textural Descriptions" (pp. 149-152) documents 24 descriptions; and "Appendix 4: Chaff Observations" (pp. 153-154) has 35 cases from seven sites. The major appendix, "Appendix 5: General Database" (pp. 155-180) contains 1,319 entries each characterized by: specimen number, site, field number, consistency, color, inclusions and "status." The latter indicates that 67 specimens were studied through thin section analysis, 209 by binocular microscopy, and 901 by optical methods.

Coolidge has provided an important study on Neolithic pottery from Southern Turkmenistan, Central Asia, that specialists working on ceramic studies in the entire region will find very useful for comparative data. In addition, she has

provided a viable model of Neolithic semi-nomadic culture that deserves further examination.

Mark Pollard, Catherine Batt, Ben Stern, and Suzanne M. Young, *Analytical Chemistry in Archaeology*, Cambridge Manuals in Archaeology, New York: Cambridge University Press, 2007. xvi + 404 pp., 93 figs., 13 tables, appendices, references. ISBN-13: 9780521652094 (hardback), \$95.00; ISBN-13: 9780521655729 (paperback), \$45.00. This 13<sup>th</sup> volume in the Cambridge Manuals in Archaeology series was prepared by A. M. (Mark) Pollard (Edward Hall Professor of Archaeological Science, Research Laboratory for Archaeology and the History of Art, University of Oxford), Cathy M. Batt (Senior Lecturer in Archaeological Sciences, University of Bradford), Ben Stern (Lecturer in Archaeological Sciences, University of Bradford), and Suzanne M. M. Young (NASA Researcher and Lecturer in Chemistry, Tufts University). The volume contains chapters on the basic chemistry and physics necessary to understand the techniques used in analytical chemistry, and there are more detailed chapters on some methodologies. I provide a general overview but focus on those portions of the text that relate to archaeological ceramics. There is a general discussion of pottery (pp. 213-214) and comparisons of the analytical methodologies. In addition, there are useful, albeit brief, discussions of mineralogical change (p. 27) and organic residue analysis (p. 23).

The book has three main components, one that would suffice as a journal article and two which are small books by themselves: Part I, The Role of Analytical Chemistry in Archaeology (pp. 1-43) is a lengthy essay that provides a history of analytical chemistry in archaeology and considers basic archaeological questions, questions of process, the nature of analytical chemistry, and special considerations in the analysis of archaeological materials. Part II, The Application of Analytical Chemistry to Archaeology (pp. 45-214) contains seven chapters, the first of which, "Elemental Analysis by Absorption and Emission Spectroscopies in the Visible and Ultraviolet" (pp. 45-69) considers optical emission spectroscopy (OES), atomic absorption spectroscopy (AAS), and ICP-AES, followed by a succinct comparison of analyses of these methodologies and case studies (Greek ceramics and European bronzes); the discussion of AAS (pp. 48-56, 67-68) is particularly valuable. In "Molecular Analysis by Absorption and Raman Spectroscopy" (pp. 70-84), the authors provide general information on optical and UV spectrophotometry, as well as infrared absorption, Raman, and vibrational spectroscopies. "X-ray Techniques and Electron Beam Microanalysis" (pp. 93-122) includes a short discussion on X-rays, X-ray fluorescence (XRF) spectrometry, the use of the electron microscope as an analytical tools, X-ray diffraction (XRD), and a few others. "Neutron Activation Analysis" (pp. 123-136) contains a basic introduction to the principles and practices of NAA and archaeological applications, including ceramics (pp. 125-134); there are additional scattered references to NAA (pp. 101-109, 118-120). "Chromatography" (pp. 137-159) provides an overview of basic principles, "classical" liquid column chromatography, thin layer (TLC), gas (GC), and high

performance liquid chromatography (HPLC). "Mass Spectrometry" (pp. 160-194) has separate discussions of light stable isotopes and heavy isotopes, as well as thermal ionization mass spectrometry (TIMS), and combined techniques such as GC-MS. Lastly, "Inductively Coupled Plasma-Mass Spectrometry (ICP-MS)" (pp. 195-214) focuses on types of analyses, comparisons with other techniques, and archaeological applications; readers are referred especially to pp. 195-200. Part III, Some Basic Chemistry for Archaeologists (pp. 215-325) has four chapters that provide basic information on atoms, isotopes, the Periodic Table, valency, bonding, the electromagnetic spectrum, and "practical issues" in analytical chemistry. There are seven appendices: Scientific Notation; Significant Figures; Seven Basic SI Units: Physical Constants; Greek Notation; Chemical symbols and Isotopes of the Elements; and Electronic Configuration of the elements (to radon,  $Z = 86$ ). Designed as an introductory manual that explains the basic concepts of chemistry related to scientific analytical techniques relevant to archaeology the authors explicate key terminology, outline the procedures to be followed in order to produce good data, and describe the function of the basic instrumentation required to carry out those procedures. References (pp. 350-390) contain 748 entries and there is a useful index (pp. 391-403) of topical and proper noun terms. This manual can be used as a textbook or as a general reference work and is valuable for pedagogy as well as for novices and seasoned researchers.

Dragos Gheorghiu (ed.), *Ceramic Studies: Papers on the Social and Cultural Significance of Ceramics in Europe and Eurasia from Prehistoric to Historic Times*, BAR S-1553, 2006; ISBN 184171982X, £25.00. iii + 84 pages; maps, tables, plans, figures, drawings and photographs. The ten papers (nine in English and one in French) derive from a symposium, "Ceramics in the New Millennium," presented at the 2002 European Association of Archaeologists Conference in Thessaloniki, Greece. Each chapter has separate sets of references. The contributions include a very brief "Introduction: One More Contribution on Ancient Ceramics" by Dragos Gheorghiu (p. 1). The editor is also the creator of *Studia Vasorum*, an e-journal of theory and experiment in ceramics that sought to promote ceramic studies and to document archaeological research and theory. The journal's aim was to present an interdisciplinary approach to ceramic analysis, technology, typology and decoration analysis, through the integration of theory and experiment. Most of the papers in this BAR volume appeared in *Studia Vasorum* in 2002 and 2003, but the Web site, <http://www.studiavasorum.ro/>, is no longer accessible. He is also the editor of *Fire in Archaeology: Papers from a Session Held at the European Association of Archaeologists Sixth Annual Meeting in Lisbon 2000*, British Archaeological Reports International Series S-1089, 2003. shall briefly summarize the ten papers in this new volume.

"The Threshold Model for Ceramic Resources: A Refinement" by Dean E. Arnold, Wheaton College, Illinois, USA (pp. 3-9, 4 figures, 4 tables) is a fine-tuning of the paradigm that Arnold published in his 1985 volume, *Ceramic Theory and*

*Cultural Process* (Cambridge and New York: Cambridge University Press). It is also a reworking of the paper he presented in the symposium “Ceramic Ecology Revisited 1998: Current Research on Ceramic Materials” that your reviewer chaired at the American Anthropological Association annual meeting. The model concerns the identification of local vs. nonlocal ceramic production by examining distances to raw material resources and devising a cross-cultural paradigm from the data. The revised model provides an empirical basis for the development of economic models on a more micro level and enables archaeologists to “locate ceramic producing communities in geographical space using geological data, on one hand, and ceramic paste data, on the other” (p. 8). He also considers three applications of the model and suggests that the refinements provide more objective thresholds of distances to ceramic resources than the initial version of the model. “Some Approaches to Ceramic Study” by Ludmila Koryakova, Archaeological Laboratory, Ural State University, Russia (pp. 11-17, 6 figures) provides an assessment of Sargat household pottery recovered from human burials in the Trans-Urals during the Early Iron Age. The author relates some approaches used for ceramic investigations that she finds “interesting” and begins with a discussion of clay selection within a “core catchment area” of 1-5 km (Arnold’s work on this topic is not referenced). She also presents a schematic representation of “Life History of a Pottery” prior to a semiotic-based discussion of ornamental signs (grouped into a syllabic “formula”) found on the ceramic vessels and an interpretation of their sociocultural meanings expressed by a mathematical equation. The majority of the references are in Russian but a number of American authors’ names are misspelled: Feinmann for Feinman; Scibo for Skibo, and Shiffer for Schiffer; Sargat is sometimes “Sagat” and “dynamic” occurs twice. She concludes that “semiotic approach has a good potential for pottery analysis but it requires a strong methodological grounding” (p. 17). The author would benefit from an examination of Robert Preucel’s *Archaeological Semiotics* (London: Blackwell, 2006) while J. Theodore Peña’s *Roman Pottery in the Archaeological Record* (Cambridge and New York: Cambridge University Press, 2007), reviewed in this *SAS Bulletin*, provides a different perspective on the life-cycle of ceramics.

“Technological Chain and Visibility: Ceramic Styles and Social Changes in Late Prehistory in the North-west Iberian Peninsula” by Maria Pilar Prieto-Martinez, Instituto de Investigaciones Tecnológicas, University Santiago Compestella, Spain (pp. 19-27, 11 figures, 7 tables) examines ceramics from Galicia during three time periods with relative chronological placements: Early-Middle Neolithic (4500-3000 BCE), Late Neolithic (3000-3600 BCE), and Early Bronze Age (2600-1400 BCE) – there is a cursory discussion of the Late Bronze Age. Funerary and domestic ceramic are examined using the “Technical Operative Chain” (*chaînes opératoires*, following Lemonnier 1986, 1991), in order to explicate three goals: discern social intentions in the technological choice that were made during different stages of production; find out if this “intentionality” is related to observable strategies from within these cultures, and see if the “visibility strategies” contribute

to characterizing ceramic styles from different prehistoric periods. She discerns a “gradual increase in internal diversity through time and an increase in formal differentiation and of visibility strategies” in the Galician communities studied (p. 26).

“On Chalcolithic Ceramic Technology: A Study Case from the Lower Danube Traditions” by Dragos Gheorghiu, Department of Research, National University of Arts, Bucharest, Romania (pp. 29-42, 26 figures, 1 color plate and 1 color images on the cover) utilizes data from the author’s Vadastra Project centered in Vadastra, a Balkan Chalcolithic village on the Lower Danube. There are five research goals related to Gumelnita ceramics: identify the *chaînes opératoires* of ceramic technology through experimentation; analyze firing technologies from Antiquity to understand the Neolithic ones; understand technological diversity; create new taxonomies to differentiate ceramic objects; and discern relationships between ceramics and society. The author discusses painting ceramics with gold powder, prestige assemblages, reduction firing, surface finishing, burnishing (“a sort of sintering technique”), roughened textures, and prestige ceramics and their visibility and portability. He concludes with a valuable discussion of ceramic technology in the Eastern European Chalcolithic and includes three brief appendices: Burnishing Gold on Vases, Firing in [a] Reduced Atmosphere, and Three-Phase Firing in Pits.

“Basal Motifs on Bronze Age Pottery across the Eurasian Steppe” by Karlene Jones-Bley, University of California, Los Angeles, USA (pp. 43-51, 6 figures) is an English-language version of her 2003 Russian-language paper. She discusses the earliest examples of basal motifs on ceramic libation vessels and the four types of Middle Bronze Age basal motifs prevalent during the Bronze Age: circles, cruciforms – the most common, checkerboards (or hatched), and random markings. Associations in domestic contexts and burials are reviewed and the disappearance of the motifs is considered. The author speculates about ritual associations, the drinking of Soma, solar deity sacrifices, and possible changes over time. “La céramique de l’Age du Bronze Moyen et Récent en Italie nord-occidentale” by Laura Domanico (pp. 53-61, 3 figures) focuses on Middle and Recent Bronze Age (15<sup>th</sup>-13<sup>th</sup> centuries BCE) pottery from northwest Italy in a study of the characteristics of “western culture” and regional differences. She compares the ceramic production of bowls and biconical goblets from north of the Alps (southeastern France and southern Switzerland) and northeastern Italy with the Italian northwest and develops a chronological framework with three Middle Bronze Age stages (MB1, MB2, and MB3) and two for the Recent Bronze Age (RB1 and RB2) and relates these to the Swiss-Rhine group (Bz B, C1, and C2, and Bz D1 and D2). “Iron Age Ceramics in Western France: A Multidisciplinary Approach” by Marie-Yvane Daire-Langouet and Guirec Querré, with the assistance of Laurent Quesnel, all at Laboratoire d’Anthropologie, Université de Rennes, France (pp. 63-67, 6 figures) concerns a study of wares from Amorica Iron Age La Tène farm sites in northern Gaul. The analysis employs “classical analysis (typology, chronological evolution, etc.) combine[d] with petrographic and geochemical studies

on the raw materials..." (p. 63). The authors review the raw materials, methods, and general results, and discuss "Proto-onctueuse" ceramics and "fine cordoned wares" from Brittany. Distribution/diffusion patterns are suggested and the latter ware reached southern England where it was imitated by local producers. The authors emphasize the importance of a multidisciplinary analysis. However, there are only general statements about the petrographic analyses and XRD studies, and the number of specimens studied is not reported.

"Ceramic Researches in Northern Etruria: Archaeological and Archaeometric Aspects" by Simonetta Menchelli (Department Scienze Storiche Mondo Antico, University of Pisa, Italy), Claudio Capelli (Dipartimento per lo studio del territorio e delle sue risorse, University of Genoa, Italy) and Marinella Pasquinucci (Department Scienze Storiche Mondo Antico, University of Pisa, Italy) (pp. 69-75, 12 figures) focuses pottery found in the Pisae and Volaterrae areas dating from the 3<sup>rd</sup> century BCE to the Late Roman period. Five principal local coarse ware temper groups were discerned on the basis of petrographic analysis (p. 70) but only four are discussed. Groups I and IV are cooking wares, while Groups II and III are tablewares such as bowls, dishes, and jugs. Four imported coarse wares are also considered: Latium and Campana, where potters produced cooking wares and mortars; North African (Tunisian area), where artisans made kitchen wares; Eastern Mediterranean areas (Asia Minor, Attica, and Crete), where workshops fabricated both cooking and table wares; and Pantelleria Island, where potters produced specialized cooking wares. Thin section microphotographs illustrate the article; sample sizes are not reported. The last contribution is "Material Values Past and Present: The Intellectual History of the Study of Greek Ceramics" by Michael Vickers, University of Oxford, Jesus College, UK (pp. 77-84, 11 figures). The author reconsiders the status of Greek pottery and its iconographic interpretations, noting that "its status in antiquity has been exaggerated" (p. 77). He reports that pottery was hardly ever mentioned in the ancient sources and focuses his discussion on silver-gold vessels and their value in Attic society versus Attic red-figured pottery and comparisons of elite versus subsistence level expenditures (wine and cloaks vs. grain and tunics). The changing role of the artist and the use of pottery as surrogates for gold-silver vessels make for delightful reading.

This diverse set of papers are more or less in chronological order and focus on Eurasian subjects, predominantly ceramic topics related to southern and eastern Europe. There is no overriding theme except to implicitly demonstrate that ceramic studies are alive and well in this region. The English-language papers prepared by these scholars are readable but grammatical and, especially, typographical errors detract from the authors' presentations. Nonetheless, these contributions are worthy additions to understanding ceramic production and distribution.

### Brief Reviews

Alex Gibson, *Prehistoric Pottery in Britain and Ireland*, Stroud, Gloucestershire, UK: Tempus Publishing Ltd, 2002, 160

pp., 71 black-and-white figures, 20 color plates, glossary, index. ISBN-13: 978-0-7524-1930-5, ISBN-10: 0-7524-1930-7 (paperback), \$29.99. This introduction to prehistoric pottery in Britain and Ireland is intended for the general reader rather than the specialist, but this is a delightful, clear, concise, and well-written volume that would profitably be read by students and by scholars and others wanting background information on British archaeological ceramics. Gibson takes a thematic and then chronological approach, discussing the presence of different styles and forms of pottery, their methods of manufacture, the contexts in which they were used and the importance of being able to date them, analyze their contents and make inferences about ancient economies and cultures. Structurally, the volume has eight chapters, three of which provide useful introductory information and background, and four which characterize chronological periods. These are supplemented by a 51-item glossary (pp. 141-145), a useful bibliography with 118 entries (pp. 47-153) and an index of mostly proper noun terms (pp. 155-160). The 71 monochrome illustrations are found throughout the narrative, while the 20 color plates are clustered between pages 64 and 65. There are a few typographical errors, viz. "Chaloclitic" (p. 138). Chapter 1, "Introduction: Why Pots." (pp. 9-31) provides a definition of ceramics, reviews terminology, and considers pottery as a dating tool, ceramics as economic indicators, and their roles in distribution and trade, pottery functions, and use in rituals. "Aspects of Manufacture and Ceramic Technology" (pp. 33-5) provides basic information on clays and inclusions, techniques of manufacture, and firing, while Chapter 3, "Decoration and Surface Treatment" (pp. 51-68) considers incision, impression, application, and burnishing, as well as the identification of individual potters. Subsequent chapters relate chronologically pottery dated to the "The Earlier Neolithic: 4000-3000 BC," (pp. 69-82); "The Later Neolithic and the Earlier Bronze Age: 3000-1000 BC" (pp. 83-108); "From Bronze Iron Age: 1000-600 BC" (pp. 109-116); and "The Iron Age: 600 BC to the Roman Conquest" (pp. 117-135). The latter chapter is divided into three geographic units: Southern England, The Midlands, and North of England and Mainland Scotland. The "Postscript" (pp. 137-139) included mention of Gibson's participation in 2000 in the Vadastra Project with Dragos Gheorghiu. The project is discussed briefly in Gheorghiu's *Ceramic Studies: Papers on the Social and Cultural Significance of Ceramics in Europe and Eurasia from Prehistoric to Historic Times* (see a review of this volume in this *SAS Bulletin*).

Kevin Leahy, *Anglo-Saxon Crafts*, Stroud, Gloucestershire, UK: Tempus Publishing Ltd, 2003, 192p, 86 black-and-white illustrations, 25 color plates, glossary, index. ISBN-13: 978-0-7524-2904-5, ISBN-10: 0-7524-2904-3 (paperback), \$37.50. Following the withdrawal of the Romans and a period of decline and insecurity that it brought, Anglo-Saxon towns and cities grew and prospered, as did their local industries. The skills of Anglo-Saxon craftsman are frequently acknowledged but the techniques, materials and tools that they employed, and workshop versus itinerant lifestyle, are rarely discussed in any detail in the extant literature. This well-written analysis covers all manner of Anglo-Saxon crafts (except for



agriculture and building in stone), from gilding and soldering, book binding and making shoes, to coopering and making musical instruments. In the main, Leahy looks at archaeological evidence in reviewing the skills and techniques in working with wood, glass, metal, clay, leather, textiles and other animal products. Pottery, pp. 95-104m figures 50-54, color plates 9, 10, 11, 17, 22). In this chapter, Leahy reviews the composition of clay, fillers, and the technological developments in manufacture and firing of pottery during three periods: Early, Middle, and Late Anglo Saxon. This is a very useful summary of a period little understood by scholars and draws together diverse information on a number of crafts.

Katharine F. Hartley and Roberta Tomber, with Peter V. Webster (eds.), *Journal of Roman Pottery Studies 13: A Mortarium Bibliography for Roman Britain*, 2007. ISBN-13: 978-1-84217-263-6, ISBN-10: 1-84217-263-8, \$48.00/24.00 (paperback). Available through Oxbow Books. Mortarium studies have enormous value in addressing a variety of themes including source, chronology, function, distribution, and as an index to trade and Romanization. This study, commissioned by English Heritage, was designed in 1992, begun in 1995 and completed in 1998. The bibliography took until 2001 to update and can now be presented in final form. It deals with the country in twelve geographical regions, designated by modern county boundaries, but grouped as far as is possible to reflect ancient pottery traditions. The Contents include: "Introduction: Comments and Prognosis" (K. F. Hartley); "Imported Mortaria: Scotland; Hadrian's Wall and Environs: Cleveland, Cumbria, Durham, Northumberland, Tyne & Wear; North-East England: Lincolnshire and North Lincolnshire, North, South, East and West Yorkshire; North-West England: Cheshire, Greater Manchester, Lancashire, Merseyside; East Midlands: Derbyshire, Leicestershire, Nottinghamshire, Staffordshire; South-East Midlands: Bedfordshire, Buckinghamshire, Cambridgeshire, Northamptonshire; West Midlands: Herefordshire, Shropshire, Warwickshire, West Midlands, Worcestershire; East Anglia: Essex, Norfolk, Suffolk; South Central England: Berkshire, Hampshire, Isle of Wight, Oxfordshire; South-East England: Greater London, Hertfordshire, Kent, Surrey, Sussex; South-West England: Avon, Cornwall, Devon, Dorset, Gloucestershire, Somerset, Wiltshire, Scilly & Channel Islands"; "Wales" (P. V. Webster); and Place Name Index (P. V. Irving). Specific recommendations are also made for further research. This is a valuable addition to a significant series.

Kellee A Barnard and Thomas M Brogan, *Mochlos IB: Period III. Neopalatial Settlement on the Coast: The Artisans' Quarter and the Farmhouse at Chalinomouri: The Neopalatial Pottery*, Prehistory Monographs 8, INSTAP Academic Press, 2003, 345 pp., 4 color and 95 black-and-white figures, 63 tables, 28 black-and-white plates, 2003. ISBN-13: 978-931534-07-9, ISBN-10: 1-931534-07-1 (hardback) \$80.00. Mochlos is a Minoan town set on a fine Harbour at the eastern side of the Gulf of Mirabello, in northeast Crete. It was first inhabited during the Neolithic period, and it had an important Minoan settlement during most of the Bronze Age. Mochlos I,

published in three volumes, presents the results of the excavations in the Neopalatial levels of the Artisans' Quarter, and at the farmhouse at Chalinomouri. The Artisans' Quarter consisted of a series of workshops with evidence for pottery manufacture, metalworking, and weaving. Chalinomouri, a semi-independent farmhouse with strong connections to the nearby island settlement at Mochlos, was engaged in craftwork and food processing as well as agriculture. This volume, Mochlos IB presents the pottery from the site. The contents include: "A Macroscopic Analysis of the Neopalatial Fabrics"; "A Petrographic Analysis of the Neopalatial Pottery"; "The Neopalatial Pottery: A Catalog"; and "Conclusions: The Decoration, Character, and Relative Chronology of the Neopalatial Pottery." The petrographic studies are especially illuminating as to local production and exchange.

Andrew Poulter (editor), *Nicopolis ad Istrum III: A Late Roman and Early Byzantine City: the Finds and the Biological Remains*, Oxbow Books, 2007. ISBN-13: 978-1-84217-182-0, ISBN-10: 1-84217-182-8 (hardback), \$100.00. This third and final monograph completes the description of the excavations carried out by the British team on the site of the Roman city of Nicopolis ad Istrum in northern Bulgaria. The reports here perform a dual role: they provide the material evidence upon which much of the interpretation of the site and its development is based, and they also constitute a unique resource for the palaeoeconomy and material culture of the region from the 2<sup>nd</sup>-6<sup>th</sup> centuries CE. This is the third and final monograph, completing the description of the excavations carried out by the British team, part of the Anglo-Bulgarian archaeological program on the site of Nicopolis ad Istrum in northern Bulgaria, one of the best-preserved ancient cities of the Roman Empire. The site provided a unique opportunity to compare the changing layout and economy of an urban centre from the Roman to the late Roman and the early Byzantine periods (ca. 100-600 CE). The excavations, geophysics, coins and wall-plaster were published in Volume 1. Volume 2 describes the evidence for economic changes between the Roman and early Byzantine periods and contains full reports on the pottery and the glass. This volume includes full descriptions of all small-finds (ceramic copper-alloy and iron objects, glass, pottery lamps, sculpture, architecture and flints) each object provided with a description of its archaeological context and the date of deposition. The second half of the volume identifies the environmental and economic differences between the three main periods in the history of the site. Reports include quantified assemblages of zooarchaeological finds (large and, small mammals), fish, birds, archaeobotanical remains, mollusca and human skeletons as well as the results of metallurgical analysis: copper-alloy, iron and "natural" steel. Not only is this range and quantity of finds in these reports unparalleled in the Balkans, they also represent a valuable resource for the material culture of the Roman and late Roman periods coming, as they do, from a part of the Roman Empire which has produced very few comparable assemblages. Of no less importance are the quantified bioarchaeological data which offers a unique insight into the changing morphology and economy of a Roman, late Roman and early Byzantine city. This is a significant set of

publications on an important transitional period and provides a comprehensive study of all types of material culture and biological remains.

Clive Norton (ed.), *The Pottery of Medieval Novgorod and Its Region*, The Archaeology of Medieval Novgorod, London: University College London, University College London/Oxbow Books, 2006. 6 appendices on an accompanying CD. ISBN: 1598742159, (hardback), \$99.00. Novgorod was a major medieval city and an important centre for trade routes between northern, central and western Europe and the Near East, and has been the subject of intensive investigation since the 1930s. This volume in a series devoted to the archaeology of medieval Novgorod, presents eleven studies of ceramic evidence in terms of chronology and technology, methodology of investigation, and international trade and contacts. The contributions also reflect different approaches to studying ceramics by western and Russian scholars. Some of the subjects explored include hand-made and early wheel-made pottery from the environs of Novgorod, Novgorod pottery from the 10<sup>th</sup>-15<sup>th</sup> century, handling large urban pottery assemblages, pottery imported from the west and the east, amphorae from Novgorod and the wine trade. The volume's Table of Contents includes: "The study of medieval ceramics from North-West Russia"; "Hand-made pottery from Rurik Gorodishche and Novgorod"; "Early wheel-made pottery from Rurik Gorodishche and certain questions connected with its synchronization with the pottery of Novgorod and Staraya Ladoga"; "Typology and chronology of Novgorod pottery of the 10<sup>th</sup>-15<sup>th</sup> 10<sup>th</sup> to 15<sup>th</sup> centuries"; "Pskov pottery in the 12<sup>th</sup>-16<sup>th</sup> centuries"; "Handling large urban assemblages and their statistics"; "An attempt to classify the decoration of Novgorod medieval pottery using material from Troitsky excavation XI"; "Pottery production in North-West Russia"; "Investigation of diatoms in thin sections of pottery from Gorodishche and Novgorod"; "Pottery imported from the West; Amphorae from Novgorod the Great, and comments on the wine trade between Byzantium and medieval Russia"; "Eastern pottery from the excavation at Novgorod"; and "Pottery from the settlements in the northern part of the Ilmen Region and from medieval Novgorod." Of particular interest to readers of the *SAS Bulletin* is the chapter on the processing of large urban assemblages and their statistical analyses, and the analysis of diatoms in ceramic thin sections.

Peter Jordan and Marek Zvelebil, *Early Ceramics in Eurasia*, University College London Press, 2005. ISBN-13: 978-1-84472-080-4, ISBN-10: 1-84472-080-2 (hardback), \$120.00. The authors explore the emergence of ceramics in the Late Palaeolithic of China, Japan and Eastern Siberia, and the adoption and dispersal of this technology by hunter gatherer groups of Northern Eurasia. They examine the practical impact of this had on forager communities, their health and diet, and assesses the role of ceramics as symbolic expression and a focus of social relations. The Table of Contents includes: "The Earliest World Ceramics among Hunter-Gatherers of Northern Eurasia: Chronology, Geographic Scope and Questions"; "Hunting, Gathering and Potting: Anthropological Insights into the Production, Use and Exchange of Ceramics in Mobile and

Foraging Societies." Part 1 (five chapters): "Regional Perspectives and Overviews; China; The Appearance and Spread of Pottery in the Japanese Archipelago"; "Long-Term Trends in the Pottery-Making Traditions of Prehistoric Hunter-Gatherer Cultures in NE Asia"; "Early Ceramics in Southern and Western Siberia"; "Hunter Gatherer Ceramics in NW Russia, Ukraine, Poland and the East Baltic"; and "Southern and Eastern Finland; Hunter Gatherer Cultures in Northern Fennoscandia." Part 2 (three chapters): "Analytical Case Studies; Ceramics as a Novelty in Southern and Northern Sweden"; "Ertebolle Ceramics; The Early Development of Ceramics Technology"; and "Pitted Ware Culture Ceramics; Non-Pottery Ceramic Objects." Part 3 (six chapters): "General and Concluding Discussion"; "Early Hunter Gatherer Ceramics in Regions Peripheral to the LBK Culture"; "Tracking the Emergence and Spread of Ceramics amongst Early Eurasian Hunter Gatherers"; "Current Situation and Outlook: Hunter Gatherer Ceramics."

#### *Previous Meetings*

*The Society for American Archaeology* annual meeting, attended by nearly 4,500 persons, was held 25-29 April 2007 in Austin, Texas with approximately 2,050 presentations given in symposia, general sessions, poster sessions, and forums. Among the presentations were 121 on ceramics (37 posters and 84 oral presentations). Six sessions were devoted to ceramics: "Origin and Spread of Shell-tempered Pottery in the Eastern Woodlands" (13 papers); "Poster Session: Ceramics" (10 posters); "General Session: Archaeological Ceramics" (16 papers); "Electronic Symposium: Ceramic Exchange and Stylistic Interaction among the Ancient Maya" (7 papers); "Symposium: Ceramics, Mobility, and Interaction in Late Prehistory" (10 papers); and "Symposium: Theoretical and Methodological Contributions of Hunter-Gatherer Pottery Studies" (8 papers). Among the 121 papers and posters, two had theoretical orientations, by culture area/geographical region, there were: 43 Mesoamerican presentations; 28 from the American Southwest and Great Basin; 14 from the U.S. Southeast; 7 from the Eastern U.S.; 3 from the Great Plains/Midwest, 2 from the Caribbean (Haiti and the Bahamas); 2 from the North American West (California and Alaska). The Mesoamerican contributions include 24 from southern Mexico (Yucatan, Guatemala, Honduras, and Belize) and 9 from central Mexico. Six papers and posters from South America/Lower Central America included: Panama 1; Peru 2; Amazon Basin 3. There were 3 papers on European subjects, plus 1 Eurasia, 1 Southwest Asia (Upper Tigris), 1 from South Asia (Indus Valley), and 2 from East Asia (Japan and the Philippines). There were 3 from Sub-Saharan Africa, Mali and South Africa. The number of papers on ceramics has been in the range of 5% of the total for a number of years in spite of the overall number of SAA presentations. The poster sessions have become very popular but it was unfortunate that a poster session and a set of oral papers on ceramics were scheduled at the same time Thursday evening. In addition to the book of abstracts (457 pages), attendees also received a "read only" CD of these abstracts (Mac or PC format choices); searching is possible

but printing is not. Overall, a very successful meeting but it is impossible to hear all of the oral presentations on ceramics.

*Terracotta Figurines in the Greek and Roman Eastern Mediterranean: Production, Diffusion, Iconography and Function* is the focus of a symposium that was held 2-6 June 2007 in Izmir, Turkey. This meeting was profiled in the previous issues of the *SAS Bulletin*; the following is a conference update. The symposium focused on terracotta figurines of the Eastern Mediterranean in Antiquity (7<sup>th</sup> c. BCE-4<sup>th</sup> c. CE) and approximately 190 participants from 25+ countries (ca. 40 from Greece) discussed a range of issues concerning terracotta figurines. This conference had ca. 110 presentations (45 oral with the remainder given as posters). More than 120 sites in the eastern Mediterranean were represented among the presentations. These included Greece (Athens, Kerameikos, Corinth, Corfu, Petres, Tanagra, Boeotia, Thebai, Olynthus, Ithaca, and others); Asia Minor (Miletus, Myrina, Pergamon, Ephesus, Didyma, Parion, Assos, etc.); Cyprus; Sicily; Italy; North Africa; Israel; Syria; Jordan; Egypt; Bulgaria; Romania; and Ukraine. Thematically conference was divided into funeral, domestic and votive terracotta figurines, and papers were examining production, diffusion, iconography and function of the Greek and Roman terracotta figurines, from the beginning of mass production (7<sup>th</sup> century) to the end of Classical tradition (4<sup>th</sup> century). The papers presented at the conference will be published in 2009 as E. Laffli and A. Müller, editors, *Figurines de terre cuite en Méditerranée orientale grecque et romaine. Production et Diffusion, Iconographie et Fonction. Colloque international, 2-6 juin 2007 / Izmir, Turquie*, in the series of Ecole française d'Athènes, *Bulletin de Correspondance Hellénique*, Supplements (Paris/Athens). Because of the success of this symposium, a number of scholars are interested in inaugurating an international association based in Izmir for Greek and Roman coroplastic studies, entitled, "Exempli gratia, Diphilos: Association pour l'étude de la coroplasticité grecque et romaine." An electronic newsletter is also under consideration and would be Newsletter for Greek and Roman Coroplastic Studies." Additional information is to be found on the symposium's Web site, <http://web.deu.edu.tr/terracottas>.

#### Forthcoming Meetings

The 74<sup>th</sup> Annual Meeting of the Eastern States Archaeological Federation will feature a planned session entitled "Analytical Applications in the Archaeology of Eastern North America." The ESAF meeting is scheduled for 8-11 November 2007 in Burlington, Vermont, USA. Staff at the Archaeometry Laboratory at the University of Missouri Research Reactor is soliciting papers for this session which will highlight recent analyses of archaeological materials from eastern North America, and will provide a venue for presenting new research involving archaeometry, computer applications, geoarchaeology, and other methods used to advance our knowledge of past cultures. Submissions and requests for additional information should be directed to Matthew Boulanger at the Archaeometry Laboratory, [boulangerm@missouri.edu](mailto:boulangerm@missouri.edu).

Titles and short abstracts (200-250 words maximum) are due by 1 August 2007. Additional information on the 74<sup>th</sup> Annual ESAF meeting can be found on the Web site of the Eastern States Archaeological Federation, <http://esaf-archeology.org>.

*Ceramic Ecology XXI: Current Research on Ceramics 2007*, is a symposium scheduled for the annual meeting of the American Anthropological Association to be held in Washington, DC, between 28 November and 2 December 2007. The organizer and chair is Charles C. Kolb (National Endowment for the Humanities), and the discussant is E. Christian Wells (University of South Florida). The session abstract and the abstracts of the 12 presentations follow. Symposium Abstract: The papers in this international and interdisciplinary symposium, the 19<sup>th</sup> in the annual series, reflect a number of approaches within the framework of Matson's concept of Ceramic Ecology, set forth in his volume, *Ceramics and Man* (1965). In this work Matson a ceramic engineer, archeometrician, ceramic ethnoarchaeologist, and ethnographer stated that "unless ceramic studies lead to a better understanding of the cultural context in which ceramic materials were made and used, they form a sterile record of limited worth." Ceramic Ecology as a methodological and theoretical approach has as its paramount goal a better understanding of the peoples who made and used pottery and seeks to redefine our comprehension about the significance of these materials in human societies. The concept of Ceramic Ecology is contextual, multi and interdisciplinary, and analytical. On the one hand, it seeks to evaluate data derived from the application of physiochemical methods and techniques borrowed from the physical sciences within an ecological and sociocultural frame of reference. It relates environmental parameters, raw materials, technological choices and abilities, and sociocultural variables to the manufacture, distribution, and use of pottery and other ceramic artifacts. On the other hand, interpretation of these data and explanations of the ceramic materials utilize methods and paradigms derived from the social sciences, humanities, and the arts. The concept of Ceramic Ecology forms an implicit or explicit basis of the investigations reported by archaeologists, ethnographers, and others in this symposium in which emphasis is placed upon the technological and socioeconomic aspects of ceramic materials regardless of chronology or geography. It also demonstrates the value of the cross fertilization which results when investigators ranging from art historians and professional potters to ethnoarchaeologists and archeometricians come together in a forum devoted to a topical consideration: ceramics. These papers continue a symposium series initiated at the 1986 AAA meeting by students of ceramic materials who are members of the informal "Ceramic Studies Interest Group," an organization formed at the suggestion of Matson.

Charles C. Kolb (National Endowment for the Humanities) "Introduction to Ceramic Ecology XXI 2007: Current Research on Ceramics."

Dean E. Arnold (Wheaton College, IL) "On the Holism of Ceramic Ethnoarchaeology: Past is Present." Studies of ceramic production, like those in archaeology, have lurched

from paradigm to paradigm with one paradigm being replaced as another comes into fashion. Old paradigms are discarded because of their inability to explain the entire phenomenon under study or because old paradigms are prejudicially regarded as anachronistic. In particular, ceramic ecology has been regarded as too deterministic and some archaeologists see the need to replace it with paradigms such as technological choice, practice theory, and the social embeddedness of technology. These new paradigms have come from European colleagues, but their perspectives have never been absent from ceramic ecology or from ceramic ethnoarchaeology. This paper will show how previous work in ceramic ecology illustrates technological choice, social embeddedness of technology, practice theory, and suggests a way of combining these paradigms with engagement theory. The paper concludes with a plea for recognizing the truth value of holism and the complementarity of different paradigms.

John Carlson (University of Maryland) “Maya Flasks, Medicines, and Merchants: Exploring a Specialized Ceramic Complex from the Classic Period to the Present.” “Maya flasks” constitute a highly distinctive class of small clay bottles most of which date from Late Classic times (ca. 650 – 900 C.E.) and are found all across the Maya zone and as far south as Nicaragua and Costa Rica. Most are constructed with a characteristic defining flange-lipped spout and were created in a wide variety of forms with several different techniques of manufacture and decoration. Never previously studied as a group, the author’s interdisciplinary “Maya Flasks and Miniature Vessels” Project, begun in 1992, has accumulated measurements, photographic documentation, and other data on well over 450 examples from both unprovenienced and documented archaeological collections. An overview of the project’s results, then nearing completion with the support of a Kislak Fellowship in American Studies at the Library of Congress, was first presented at the 19<sup>th</sup> Ceramic Ecology Symposium at the 2005 Annual meeting of the American Anthropological Association held in Washington, DC. The central conclusion, to date, is that most Maya flasks were *primarily* created to hold medicines and potions, largely composed of powdered tobacco and alkaline lime preparations (“*may*” or “*moy*,” often with other ingredients) which were used for a wide variety of medicinal (e.g., for midwifery practices and birthing), ritual, magico-protective, and perhaps recreational uses. These practices, including the use of flasks, continue today in some traditional Maya communities, and this includes their employment by merchants, emissaries, and couriers. This presentation focuses on the use of flasks and their contents in Maya merchant activities, past and present, with special reference to the Maya God L, and related Maya merchant entities. In addition to providing a reading of God L’s name, the author has been able to demonstrate that this deity was primarily the Maya God of Medicine and Curing, essentially the chief “Shaman” or “Priest,” the personification of Tobacco in all forms including the many “*may*” tobacco and lime formulations – in the same sense that the Maya Maize God E is the personification of Maize – as well as being the Chief Patron God and protector of Merchants. He also has a female

counterpart, the Old Maya Goddess “O.” These discussions and arguments are based on chemical analyses of contents, archaeological, ethnohistorical, and ethnographic data as well as Maya iconographic and epigraphic analyses.

Travis W. Stanton (Universidad de las Américas, Puebla; Cholula, Puebla, México) “Ceramic Ethnoanalysis in Yucatán: Experimenting with Calcite Tempers.” The study of archaeological ceramics can be illuminated by ethnoarchaeological and ethnographic studies of modern day potters. Most ethnoarchaeological studies of ceramics, however, have focused exclusively on modern day production and distribution systems. In this paper, we present a more novel way of combining what might be considered a version of ethnoarchaeology with archaeological data. We term this method archaeological ethnoanalysis. In our application of this method, archaeological ethnoanalysis falls in a liminal zone among the topics of ethnoarchaeology, materials analysis, experimental archaeology, and multidisciplinary research. We apply the idea of ethnoanalysis to the study of Maya tempers from Yucatán.

Marilyn Beaudry-Corbett (Cotsen Institute of Archaeology, University of California at Los Angeles) “Open Pit Firing as a Replication Technique for Archaeologists.” Pottery production is an important part of economic organization in all types of societies and firing is a critical part of that production. The firing step is when the ceramic’s plastic characteristic is permanently solidified by transferring heat to the ware. We know from ethnographic studies that many potters even those producing sizable amounts of vessels use non-kiln, open firing because the method is comparatively cheap and does not require the heavy capital investment needed to construct and maintain a kiln. Understanding open firing procedures can help archaeologists reconstruct aspects of prehistoric technology that provide insights into a culture being studied. Details about the process of open pit firing are described and the data generated are related to archaeological concerns.

Elin Danien (University of Pennsylvania Museum of Archaeology and Anthropology) “Chama Polychromes: Uncovering the Subtext behind the Iconography.” The site of Chama in the Alta Verapaz region of Guatemala is well known for its Late Classic polychrome ceramic vessels. Chama-style pottery is readily recognized. The cylindrical vases or cups have black- or brown-and-white chevron motif bands painted around the rim and base, a bright white and strong red-and-black palette, and distinctive yellow to yellow-orange background colors. The preferred decorative template is a repetition of a static scene or individual on each half of the vessel surface, or a continuous scene that wraps around the cylinder; and in some instances the vessel is decorated with a pattern of geometric motifs. Where hieroglyphic texts are present, they are usually either shortened versions of the Primary Standard Sequence, simple repetitions of day names, person identification or pseudoglyphs. The painted scenes and figures that adorn these vessels have been interpreted as illustrations of deities and myth. This paper examines several

Chama vessels in the collection of the University of Pennsylvania (the only museum collection of Chama pottery in the country with secure provenance), and suggests a different purpose for their designs. Recent discoveries in the lowlands, combined with ethnographic and ethnohistorical data, provide a rationale for the short-lived florescence of this easily identified and much appreciated style. Far from illustrating Maya mythology, many of the Chama vessels reflect the unrest of the Maya world at the beginning of the Late Classic, and reveal some of the political, economic, and ritual life of the little-known site of Chama.

Patricia A. Urban and Edward Schortman (both Kenyon College) “Where There’s Smoke, There’s...Something: The Possible Behavioral Significance(s) of Candeleros in the Late and Terminal Classic Naco Valley, NW Honduras.” The artifact category known as candeleros is most strongly documented from Teotihuacan, where the assemblage consists largely of single and double chamber examples, with burning found at the bases of the chambers. They are generally considered to be personal incense burners used in small-scale rituals. Large quantities of candeleros—over 1200—dating to the Late to Terminal Classic (AD 600-1000) were also unearthed in the Naco valley, Northwestern Honduras. Widely reported across Southeast Mesoamerica in small quantities, except for Copan, where over 800 are reported, these distinctive ceramic artifacts appear at all excavated Naco valley sites. Items in this sizable assemblage range from those with one to 27 chambers and from undecorated examples to elaborately modeled objects. Such variety in size and decoration implies an equally broad array of activities in which candeleros functioned. This paper briefly describes the collection and reviews what the results of distributional studies conducted at a sizable Naco valley center suggest about candelero functions.

Larkin Hood (University of Washington) “Pottery as a Tool for Understanding Variability in Hunter-gatherer Economics: New Information from the Upper Texas Coastal Plain.” While interesting in their own right, one of the greater merits of pottery studies lies in their ability to address larger anthropological questions. Analysis of hunter-gatherer pottery can contribute to anthropological understanding of the immense variability in hunter-gatherer adaptations, past and present. We can increase the power of explanatory models of hunter-gatherer evolution by investigating the presence of ceramic vessels in hunter-gatherer adaptations in terms of their economic as well as their social potential, with the understanding that economic and social behavior are commonly linked. This paper discusses the results of functional analyses of Late Prehistoric (AD 600-1528) period wares from the upper Texas coastal plain, a region in which hunter-gatherer societies produced pottery unanticipated by conventional anthropological models. Like their neighbors in the Lower Mississippi Valley, prehistoric inhabitants of the Upper Texas coastal plain (UTCP) made and used pottery. Yet UTCP hunter-gatherers did not produce archaeological signatures associated with use of cultigens, wild starchy seeds, or highly sedentary village settlements. Analysis of organic residues (fatty acids) from three UTCP pottery assemblages provides

new information about hunter-gatherer diets in this region. Coupled with analyses of vessel construction and use, the organic residue data provide new insight on UTCP subsistence, and the economic strategies groups used to cope with food shortages. The paper closes with a discussion of the implications for other work on hunter-gatherer subsistence, mobility, and food storage strategies.

James M. VanderVeen (Indiana University South Bend) “Refuting Historical Documents with Domestic Ceramics: A Re-analysis of Cultural Dietary Patterns in Colonial Hispaniola.” The sailors and priests who chronicled the European exploration of the islands in the Caribbean Sea lauded the abundance of flora and fauna. Although easily accessible, and recognized as safe, these foods are thought to have been avoided by the visitors due to a sense of cultural superiority over the local people. Columbus took extraordinary efforts to ensure sufficient provisions from the Old World for his later voyages, ignoring the richness of edible resources already discovered. Still, rations for the settlers were restricted, and returning sailors often complained of constant hunger. The feeling of a lack of fulfillment may have had to do with a psychological yearning for the comforts of home as much as a physical ailment. Yet a severe famine was reportedly faced by the earliest colonists. The suggestion in the historical texts that Europeans refused to eat the same foods that sustained the indigenous residents of the islands is indirectly supported by a lack of native animal bones and plant materials in the archaeological record. Recent evidence collected from domestic ceramic vessels, however, tells a different story. Using new analytical techniques, preserved organic materials have been recovered from within the walls of cooking pots. These data show how the subsistence patterns of both cultures were rapidly and significantly influenced by their contact. The dietary information provided by ceramic artifacts, previously imperceptible and thus ignored, may result in a revision of our understanding about the interactions between colonizers and the colonized.

Kostalena Michelaki and Kelly Peterson (both McMaster University; Hamilton, Ontario, Canada) “Raw Material Selection and Preparation in Neolithic Southwest Calabria, Italy.” Although ceramics in southern Italy have been studied for a long time from a chrono-typological point of view, little detailed investigation of the dynamic activity of pot making exists. Even less information exists on the social significance of the choices potters made and what those may suggest about identity making, inter-personal relations or the active negotiation between individual preferences and skill and pre-existing technological traditions. In this paper we focus on the first stage of pot-making, namely the raw material selection and preparation. We present the results of our petrographic and instrumental neutron activation analyses of Early/Middle and Late Neolithic ceramic material from the sites of Umbro Neolithic (5800-2900 cal. BC) and Penitenzeria (5500-5000 cal. BC), in SW Calabria, Italy. Comparison of archaeological ceramics with locally available clays, collected through our raw materials survey, allows us to situate the task of collecting and preparing ceramic raw materials in the wider taskscape of the

region around Umbro and Penitenzeria. This research is part of a wider project that examines the complete ceramic operational sequence – or rather sequences – and how they developed in one region (commune di Bova Marina) in the long term, from the Neolithic to the Classical Greek period.

John W. Arthur (University of South Florida-St. Petersburg) “The Ceramic Analysis of Two Abandoned Hide-Worker Households in Konso, Ethiopia.” The archaeology of recently abandoned households provides an important opportunity to address conditions relating to the preservation of activity areas and post-depositional changes related to household ceramic assemblages. In this paper, I discuss the oral history and archaeology of two abandoned Konso hide-worker households excavated during the 2001 and 2002 field seasons. The analysis compares the two households regarding the use of space and issues relating to gender, activity areas, and ceramic use and discard. In addition, use-alteration analysis of the ceramics will indicate signatures that archaeologists can use to decipher the production and consumption of beer, which serves as a dietary staple and is an integral part of the social and economic fabric of many African societies. The research demonstrates the value of blending oral history and archaeology to develop a richer picture of past household behavior.

Louise Cort (Smithsonian Institution Freer and Sackler Galleries) and Leedom Lefferts (Drew University) “Jars in the Highlands of Mainland Southeast Asia.” Since the early 1900s, scholars have documented the use and connoisseurship of stoneware jars in the highlands of insular Southeast Asia. Little attention has been paid to a corresponding tradition of jar acquisition, use, and transmission in the mainland Southeast Asian highlands. This paper, based on recent field work in the highlands encompassing central Vietnam, northeastern Cambodia, and southern Laos, outlines the complex roles of jars in trade, history, wealth and inheritance, prestige, ritual, and aesthetic systems for this region. A key feature of these jars is that they are not locally produced but exotic—manufactured in southern China, coastal Vietnam, northern Cambodia, southern Laos, central Thailand, and Burma and imported into the highlands. Some jars still in use in highland households date to the 12<sup>th</sup>-13<sup>th</sup> centuries, suggesting that the complex system of acquiring, evaluating, using, and inheriting such jars developed over centuries. Aggressive trade is necessary to amass jars; highly developed aesthetic systems, varying from group to group, determine the relative rankings of jars that lend prestige to the households and communities owning and using them. A key contribution of our research is its extension beyond the modern national borders that have typically created boundaries to scholarship. By looking at jar holdings in highland communities within all three nations, we can begin to outline nuanced variations within sub-regions based on differential aspects including access to trade routes and disruption and destruction caused by the wars of the second half of the twentieth century.

Charles C. Kolb (National Endowment for the Humanities) “From the Field and Laboratory: Current Research in Ceramic

Studies.” Members of the informal “Ceramic Studies Interest Group” (CSIG) employ a variety of multifaceted approaches in the search for answers to the questions related to ceramic materials: who, what, when, where, and why. Current field and laboratory ceramic research from both the Old and New Worlds — work that includes the disciplines of archaeology, ethnoarchaeology, ethnography, archaeometry, and materials science. Some of these field and laboratory investigations are still in progress and have not yet reached a final “paper ready” stage and research “in progress” also invites input from colleagues. Other projects have been too recently completed for a “final report” and, for others, results are in press, or have been too recently published to be generally known. The content for this report comes from correspondence from the more than 200 members of the CSIG, but some current research is reported by members of the audience.

*The 2009 International Symposium on Ancient Ceramics: Its Scientific and Technological Insights* (ISAC 2009), scheduled for March 2009 in Beijing has distributed a first circular dated 1 May 2007. The symposium is sponsored by the Shanghai Institute of Ceramics, Chinese Academy of Sciences and by The Palace Museum. The deadline for the submission of abstracts is 30 September 2007. Major subjects include: the scientific technology of ancient ceramics; testing methods; kilns and processes; the imitation and detection of false from genuine; preservation and restoration; trade in ancient ceramics, and ceramic archaeology. The proceedings will be published. Abstracts should be 500-1,000 words in English and “delivered to” Madam Tian Junjing or Mr. Wang Haisheng (Shanghai Institute of Ceramics, Chinese Academy of Sciences, 1295 Dingxi Road, Shanghai 200050; e-mail [jjtian@mail.sic.ac.cn](mailto:jjtian@mail.sic.ac.cn) and [wangsaisheng@mail.sic.ac.cn](mailto:wangsaisheng@mail.sic.ac.cn)). Upon acceptance, authors should submit two hardcopies of the full text and one CD of the contribution by 1 May 2008. Mr. Zhang Shen, e-mail [zhangshg@sunm.shcnc.ac.cn](mailto:zhangshg@sunm.shcnc.ac.cn), is listed as liaison. A paper copy of the registration form lists a Web site, <http://www.ssac.org.cn>, but it is in Chinese and a Google translation shows text dating to the meeting held in 2002.

#### *Five Newsletters on Ceramics: A Status Report*

*ACRO Update* was the quarterly newsletter of the Asian Ceramic Research Organization (ACRO), Chuimei Ho (editor) and Bennet Bronson (associate editor). Both are at the Department of Anthropology, Field Museum of Natural History, Chicago, Illinois, USA; the last editorial address was P. O. Box 14419, Chicago, Illinois 60614-0419; e-mail: [acrochicago@earthlink.net](mailto:acrochicago@earthlink.net). The articles emphasized ceramics and production sites from Japan, China, Korea, West and South Asia, and Africa and included archaeological and art historical reports on ceramics, shipwreck pottery, reports on conferences and exhibitions, and letters to the editor. The last issue published was in December 2001 (2001:3-4) and the publication is no longer viable.

*La Tinaja: A Newsletter of Archaeological Ceramics* is currently hosted by Millsaps College’s Department of Sociology



and Anthropology and is published bi-annually. The *Newsletter* is formatted by undergraduate student editors under the guidance of faculty members George J. Bey III and Michael L. Galaty (editors), has a global focus and features brief research articles, an annual list of book reviews, reports about ceramic, conferences, symposia, and book reviews. The website presently has PDFs of seven previous issues (2000-2005) available for downloading at <http://www.millsaps.edu/socio/lati.shtml>. The most recent issue published is 18(2), Spring 2007. Enquiries should be addressed to: La Tinaja, Department of Sociology-Anthropology, 1701 N. State Street, Jackson, Mississippi 39210, USA); or via e-mail: [beygj@millsaps.edu](mailto:beygj@millsaps.edu) or [galatml@millsaps.edu](mailto:galatml@millsaps.edu). Subscriptions are \$10.00 per year payable by check.

*The Old Potters Almanack*, a joint newsletter of the Prehistoric Ceramic Research Group (PCRG) and the Ceramic Petrology Group (CPG) has been published three times per year, with up to 16 pages per issue. The world wide content focuses on research reports, articles, reports on conferences, book reviews and related materials. The CPG contact person is Louise Joyner (School of History and Archaeology, Cardiff University, Humanities Building, Colum Drive, Cardiff, FC10 3UX, UK); email: [joynerl@cardiff.ac.uk](mailto:joynerl@cardiff.ac.uk); the PCGR contact is Mrs. Grace Jones (Wessex Archaeology, Portway House, Old Sarum Park Salisbury, Wiltshire, SP4 6EB, UK); e-mail [g.jones@wessexarch.ac.uk](mailto:g.jones@wessexarch.ac.uk). For membership and subscriptions, contact Caroline Cartwright (Department of Conservation, Documentation and Science; The British Museum; Great Russell Street; London WC1B 3DG); e-mail [ccartwright@thebritishmuseum.ac.uk](mailto:ccartwright@thebritishmuseum.ac.uk). The publication schedule has been sporadic and issues mailed to the United States have failed to arrive since early 2003. The last known issue is 12(3) for May 2004 (a digitized version of a hard copy was e-mailed to me). The CPG maintains a website at <http://www.ceramicpetrology.uklinux.net> (last updated July 2003) and the PCRG has one at <http://www.pcr.org.uk> (last updated in October 2006). Annual Membership Subscription Rates for CPRG are: Full Members - £8.00, Students/Unwaged - £5.00. There are several meetings per year, including one at the British Museum.

*The Society for Clay Pipe Research Newsletter* is the SCPR's illustrated publication issued twice per year with 60 pages per issue. The SCPR was founded in the United Kingdom in 1984 and, although based in England, has many members worldwide, including archaeologists, researchers of clay pipes as well as pipe makers and collectors. The aim of the society is to further enhance the study of clay tobacco pipes and their makers. The newsletter contains articles, interviews, and book reviews emphasizing UK and European materials. The SCPR organizes an annual two-day conference, usually in the UK, when they visit the clay pipe manufactories; collectors also bring their pipes for display and study. These meetings include lectures, discussions and often a walking tour on the second day. The latest issue of the *Society for Clay Pipe Research Newsletter* is Number 71 (Spring-Summer 2007). There are variable subscription rates depending on location UK, Europe,

and the rest of the World). For additional information, contact Peter Hammond (17 Lady Bay Road, West Bridgford, Nottingham, NG2 5BJ, UK); email [claypipepeter@aol.com](mailto:claypipepeter@aol.com), or Susie White (3 Clarendon Road, Wallasey, Merseyside CH44 8EH, UK); [susie@3clarendon.freemove.co.uk](mailto:susie@3clarendon.freemove.co.uk), who is Curator at The National Clay Pipe Archive (currently housed at the University of Liverpool) and editor of the *Newsletter*.

*Southeast Asian Ceramics Museum Newsletter* (SEACMN) edited by Roxanna M. Brown (Bangkok University, Rangsit Campus, Phahonyothin Road, Patghum Thanai 12120 [Thailand]); e-mail [museumnewsletter@bu.ac.th](mailto:museumnewsletter@bu.ac.th), is available gratis as a freely downloadable document on the Internet at <http://museum.bu.ac.th/newsletter.html>. It has never been published or distributed as hardcopy. This highly illustrated newsletter is published in color and averages 4-5 pages per issue with six issues per annum; the most recent issue is 4(3) for May-June 2007. The Website has links to all of the previously published issues. The contributions focus on pottery from the region, ceramic kilns, and shipwreck pottery, but the newsletter also includes reports on conferences, book reviews, and letters to the editor.

On May 14, 2007, the United States Postal Service (USPS) changed the postage rates and policies affecting periodical publications mailed to international destinations, and on July 15, a similar set of changes will go into effect for domestic (within-USA) mailings of periodicals. These policy changes affect all periodicals, including those published by federally-recognized 501(c)3 not-for-profit scientific and educational groups. How this will affect the US-based newsletters remains to be seen.

### *Exhibitions*

*Encompassing the Globe: Portugal and the World in the 16<sup>th</sup>-17<sup>th</sup> Centuries* is an exhibition that opened on 24 June at the Arthur M. Sackler Gallery in Washington, DC and runs through 16 September 2007. It is guest-curated by Jay A. Levenson, director of the international program at the Museum of Modern Art in New York. This "block-buster" show has taken over all of the Sackler the National Museum of African Art next door. It includes art objects in the African Art Museum, among them 16<sup>th</sup> century Chinese blue-and-white ceramics made to order made at Jingdezhen for Portuguese traders. There are 250 objects selected from museums in China, India, Japan, South America, and Europe, including filigreed Kongo ivories, gilded Qing astrolabes, Brazilian feather work, African ostrich eggs in ornate gold mounts, a life-size oil painting of a Brazilian cannibal, Chinese astrolabes, Indonesian puppets, a Japanese shield covered in the skin of a ray, Sri Lankan rock-crystal, mother-of-pearl Mughal inlay, an ivory saltcellar from 16<sup>th</sup>-century Nigeria, and life-size Portuguese carvings of angels and saints. The majority of the objects are arranged into geographical units defining the various parts of the world that fell within Portugal's sphere of influence during the centuries when that small nation was a global and maritime power. In the 15th century, its merchant-sailors sailing down the west

coast of Africa, searching for gold, slaves, potential Christian converts and information about new places, things and people they didn't know. There is an illustrated catalog (paper and hardbound editions) Additional information is available at <http://www.asia.si.edu/EncompassingtheGlobe/default.htm> and images of selected objects at the Arthur M. Sackler Gallery, 202/633-4880, and the National Museum of African Art, Smithsonian Institution, 202/633-4600.

### *Special Issue of Archaeometry*

*Archaeometry* 49(2), for May 2007, is a special issue on "Acknowledging Fifty Years of Neutron Activation Analysis in Archaeology," with R. J. Speakman, and M. D. Glascock as guest editors. The contributions document the history and assessment of NAA research conducted at seventeen research institutions since 1957. The institutions include: Brookhaven National Laboratory, Lawrence Berkeley National Laboratory, Michigan's Ford Nuclear Reactor, Slowpoke-Toronto, University of Sofia (Bulgaria), British Museum, Hebrew University of Jerusalem, University of Manchester, National Center for Scientific Research "Demokritos" (Greece), Smithsonian Institution-NIST, Missouri Research Reactor, Bonn Archaeometry Laboratory, Institute of Nuclear Techniques (Budapest), ITN NAA Laboratory in Portugal, Texas A&M University, IPEN Reactor (Lima, Peru), and Argentine National Atomic Energy Commission. There are summaries about research on ceramics, obsidian and other materials. This is a valuable "birthday present" for historians of science, archivists, and librarians, as well as archaeologists and archaeometricians.

---

## Book Reviews

*Stacey N. Lengyel, Associate Editor*

---

**Archaeological Computing.** Edited by Harrison Eiteljorg, II, with GIS chapter by W. Fredrick Limp, Center for the Study of Architecture, Bryn Mawr College, Bryn Mawr, Pennsylvania, 2007. iv + 244 pp., 94 figs., index. Freely available as a PDF download at <http://archcomp.csanet.org/#info>.

*Reviewed by Charles C. Kolb, Division of Preservation and Access, National Endowment for the Humanities, 1100 Pennsylvania Avenue, NW, Washington, DC 20506 USA*

The author of this work is Harrison Eiteljorg, II and the staff of the Center for the Study of Architecture (CSA), Box 60, Bryn Mawr, PA 19010; telephone 610/256-4665; e-mail contacts: <http://csanet.org/contacts/contacts.html>. The author, better known as Nick, is the Founder and Director of CSA (CV <http://www.csanet.org/pers/nevita.html>) and explains that this volume was initially conceived as a text, but the general absence of archaeological computing courses suggested that this work should instead be a "users' manual" that could be employed alone as well as in a classroom. He also notes that

the monograph also benefits from the participation of Fred Limp (University Professor and Leica Chair in Geospatial Imaging, Department of Geosciences, University of Arkansas, Fayetteville) who authored the GIS chapter. This comprehensive manual on archaeological computing is intended to provide an introduction to the use of digital technologies for archaeologists and has been "a long time in the making." The document was posted 12 April 2007, but changes are expected to occur (see a detailed explanation of document ownership, maintenance, and user requirements at <http://archcomp.csanet.org>). Nick warns that, "changes are expected to occur regularly; there will be no archiving of past versions, absent a specific need to do so" and "this document or its successors will be maintained for electronic access indefinitely."

There are two versions of the book, one for standard printing on one side of the paper only and the other for duplex printing. The text is the same; the only differences are the arrangements of margins and the orientations of pages that will be on the left in the duplex version, making the two versions equally useful on screen. Either version has margins wide enough to permit using either a loose-leaf or spring binder. The layout is based on North-American-sized 8.5 x 11 inch paper, but the margins should permit printing on A4 paper. By downloading either version, the user agrees to four terms: 1) You may download the PDF as often as you like, and you may use the file on screen, by making a printed version, or both; 2) Your own use of the PDF file is limited only in that you may not modify it. However, you may not give or sell the file to anyone else; 3) You may print as many copies from the PDF as you wish, but only for your own use. No copies may be printed for others, regardless of whether or not a fee is charged by you; and 4) Nothing in the foregoing should be seen as limiting your right to refer to, quote, or cite the work in standard academic fashion.

In the "Introduction - Why?" (pp. 1-6), Eiteljorg discusses the need for this monograph, how it will be maintained and updated, basic aims and organization, and the consequences of making it available in PDF format. "Chapter I - Some Basics" (pp. 7-24, 6 figures) provides information on data entry and storage, retrieving and presenting data, sharing data, developing a "good" computer system, the computer as encyclopedia, and CAD vs. GIS. Chapter II - Computing and Computers (pp. 25-49, 5 figures) begins with a glossary of 64 terms (Analog to Windows). Basic hardware, operating systems, applications, choosing and configuring a computer (and hardware and software), file organization, data encoding, graphics issues (color, gray-scale, and black-and-white), file sharing, and copyright are included among the topics. With "Chapter III - Recording Data about Objects, Loci, Trenches, Features, from Archaeological Projects: Databases and Database Management Systems" (pp. 51-101, 18 figures) Eiteljorg provides a 34-item glossary (4<sup>th</sup> Dimension to Unique column [field]), followed by discussions of database organization, SQL, databases for museum exhibits as well as archaeological excavation artifacts, tracking, data types, lookup tables, password protection, changing a database organization, building

a database, exporting tables, table joins, large projects and networks, referential integrity, and honoring scholarly differences.

“Chapter IV - Combining Maps and Data: Geographic Information Systems (pp. 103-143, 21 figures, selected further readings) written by Limp, begins with a 35-item glossary (Attribute to Voxel). The text begins with a basic introduction to GIS, map scale and raster resolution, map projections, databases, commercial systems, the evolving nature of GIS, differences between CAD and GIS, case studies, topological relationships and overlay operations, setting up a survey, data accessibility for environmental determinism, vector-raster conversion, digitizing existing maps to create vector maps, digitizing data from aerial photos, GPS and GIS mapping and archaeological surveys, vector or raster for site and survey data, creating 3D renderings of sites, data sets, constraints, and training. “Chapter V - Modeling Objects, Loci, Trenches, and Features from Archaeological Projects: Computer-Aided Design Software” (pp. 146-203, 43 figures) also has a glossary with 20 entries (AutoCAD to Wire-Frame). Eiteljorg discusses the production of drawings for publication, the development and benefits of CAD, AutoCAD, false precision, layering, programs using color, coordinate systems, entering field data, 3D modeling, rendering and virtual reality, 3D drawings, surveying, cross-referencing files, and CAD with GIS.

“Chapter VI - Miscellany: Digital Images, Audio Recordings, Videos, and Text” (pp. 205-213, 1 figure) considers digital images, audio and video files, text files, miscellaneous files, paper records, and XML (Extensible Markup Language). In “Chapter VII - Protecting and Preserving the Archaeological Record” (pp. 216-226), Eiteljorg presents basic information about protecting data during the life of a project, archiving archaeological information, preserving digital information, long-term preservation, migration pitfalls, metadata, data archiving, and preserving a project Web site. The final essay, “Chapter VIII – Conclusion” (pp. 227-237) has information about project planning, database to GIS and CAD linkages, CAD to GIS linkage, CAD vs. GIS, personnel, staff training, maintaining consistency, data changes, software choices, and documentation among other topics. The monograph concludes with a six-page “Index” (pp. 239-244).

A few comments and augmentations, but first my sincere thanks to Nick and Fred for creating this highly significant, readable and reader-friendly resource. The publication is as jargon-free as could be expected and covers issues ranging from survey, excavation, post-excavation work, modeling, simulation, GIS, and data preservation. It is more comprehensive and up-to-date in comparison to other works, notably Gary Lock’s *Using Computers in Archaeology: Towards Virtual Pasts* (New York: Routledge, 2003). Nick is to be especially commended for the plan to refresh, migrate, and maintain this valuable reference tool.

A citation to *Internet Archaeology* Issue 16 (p. 143), on GIS in archaeology, should have the caveat that this fully-

refereed academic online journal (1996-2006, Issues 1-21 inclusive), published by the Council for British Archaeology and hosted by the Department of Archaeology at the University of York, has been purchased by JISC Collections and an institutional sub-license is required for access, see <http://www.jisc-collections.ac.uk/internetarch> (independent scholars without academic affiliations apparently can’t use it).

Chapters VI and VII are quite brief but provide essential background on digital text, images, and a-v (your reviewer deals with these topics in his “day job” at NEH). The section on metadata is cursory and can be augmented. Metadata (information about data) has three categories: 1) descriptive (describes the intellectual content of the resource; titles abstract, keywords, object: catalog records, and finding aids); 2) structural (describes the object and relationships to other objects); and 3) administrative (information used to manage the object or control access to it; scanning parameters, storage format, rights management, and preservation parameters). The creation and maintenance and migration of digital text, audio, video, and graphic files is a complex issue. For basic guidance: Audio <http://palimpsest.stanford.edu/bytopic/audio/>, <http://www.clir.org/pubs/reports/pub96/contents.html>, and [http://www.arl.org/preserv/sound\\_savings\\_proceedings/](http://www.arl.org/preserv/sound_savings_proceedings/); for video: <http://palimpsest.stanford.edu/bytopic/video/>; and for electronic storage media: <http://palimpsest.stanford.edu/bytopic/electronic-records/electronic-storage-media/>. Presentations at the conference “Managing the Intangible: Creating, Storing and Retrieving Digital Surrogates of Historical Materials” (National Archives and Records Administration, 2007) are also useful; see <http://www.archives.gov/preservation/conferences/2007/details.html>.

The Society of American Archivists, <http://www.archivists.org/>, is a significant resource, and sells a variety of relevant publications: *Building Digital Archives, Descriptions, and Displays: A How-To-Do-It Manual for Librarians and Archivists* (Frederick Stielow, 2003), *Preservation Management of Digital Materials: A Handbook* (British Library, 2001); *Creating and Documenting Electronic Texts* (Allan Morrison et al., 2000); *Creating Digital Audio Resources: A Guide to Good Practice* (Nick Fells, 2002); and *Archiving Websites: A Practical Guide for Information Management Professionals* (Adrian Brown, 2006). A college or university archivist or librarian will often be able to provide assistance in addition to IT personnel.

Lastly, the Image Permanence Institute (IPI), <http://www.imagepermanenceinstitute.org>, (partly funded by NEH) conducts research on the stability of information media, collection management and environmental standards, ISO standards development for imaging media preservation, testing of archival and imaging materials, and outreach through publications. A joint Indiana University- Harvard University NEH-funded project, “Sound Directions: Digital Preservation for Global Audio Heritage,” is developing standards and best practices for migrating analog to digital. These are available from <http://www.dlib.indiana.edu/projects/sounddirections>.

## Upcoming Conferences

Rachel S. Popelka-Filcoff, Associate Editor

### 2007

19-23 August. 234th National Meeting and Exposition, American Chemical Society, Boston, MA USA. General information: <http://www.acs.org>.

19-23 August. XVI International Materials Research Congress, Cancún, Quintana Roo, México. Special session: Symposium 5 "Archaeological and Arts Issues in Materials Science." Contact: Dr. José Luis Ruvalcaba, Instituto de Física, UNAM, [sil@ifisica.unam.mx](mailto:sil@ifisica.unam.mx). General information: <http://www.amcm.org.mx:81/imrc2007>.

19-24 August. Goldschmidt Conference 2007 – "Atoms to Planets," Cologne, Germany. Special session on archaeometry (Theme 15). Contacts: Sabine Klein ([sabine.klein@kristall.uni-frankfurt.de](mailto:sabine.klein@kristall.uni-frankfurt.de)) and Wolfgang Müller ([w.mueller@gl.rhul.ac.uk](mailto:w.mueller@gl.rhul.ac.uk)). General information: <http://www.goldschmidt2007.org>.

9-14 September. International Meeting on Organic Geochemistry Torquay, Devon, United Kingdom. Abstract deadline: January 12 2007. General information: <http://www.imog2007.org>.

27- 29 September. Fourth Forbes Symposium on Scientific Research in the Field of Asian Art. The Freer Gallery of Art, Smithsonian Institution, Washington D.C. General information: <http://www.asia.si.edu/visitor/dcsrSymposium.htm>. Contact: Forbes Symposium 2007/DCSR, Freer Gallery of Art/Arthur M. Sackler Gallery, Smithsonian Institution, MRC 707, P.O. Box 37012, Washington D.C. 20013-7012, U.S.A; Fax: 202-633-9474; email: [dcsr@asia.si.edu](mailto:dcsr@asia.si.edu).

8-10 October. VII Iberian Congress on Archaeometry (VII Congreso Ibérico de Arqueometría). Madrid, Spain. Contact: [viicia@ih.csic.es](mailto:viicia@ih.csic.es). General information: <http://www.ih.csic.es>, <http://sapac.hispagate.com>.



**MADRID**



12-13 October. Fifth New World Luminescence Dating and Dosimetry Workshop (NWLDDW), University of Illinois at Chicago, Chicago, IL USA. Contact: Steven L. Forman, Professor University of Illinois at Chicago, Director of Luminescence Dating Research Laboratory, Director of Undergraduate Studies, Dept. of Earth & Environmental Sciences, 845 W. Taylor Street, Chicago, IL 60607-7059 Email: [sllf@uic.edu](mailto:sllf@uic.edu).

24-27 October. 9th European Meeting on Ancient Ceramics, Hungarian National Museum, Budapest, Hungary. General information: <http://www.ace.hu/emac07/>. Contact: [emac07@ace.hu](mailto:emac07@ace.hu).

28-31 October. Annual Meeting of the Geological Society of America, Denver, CO USA. "Earth Sciences for Society" Special topical sessions with archaeological relevance. For more information: GSA Meetings Dept. PO Box 9140, Boulder, CO 80301-9140, [meetings@geosociety.org](mailto:meetings@geosociety.org), Tel: +1-303-357-1090, Fax: +1-303-357-1072. General information: <http://www.geosociety.org/meetings/2007>.

8-11 November. 74th Annual Meeting of the Eastern States Archaeological Federation, Burlington, Vermont, USA. Special session: "Analytical Applications in the Archaeology of Eastern North America." Abstracts due August 1, 2007. Contact: Matthew Boulanger, Archaeometry Laboratory, University of Missouri Research Reactor, 1513 Research Park Drive, Columbia, MO 65211 [boulangerm@missouri.edu](mailto:boulangerm@missouri.edu). General information: <http://esaf-archeology.org>.

14-17 November. American Schools of Oriental Research Annual Meeting, San Diego, CA USA. Session - Artifacts: The Inside Story. Paper topics include provenance, materials characterization, raw material acquisition, workshop activity, manufacturing techniques, and ancient technology. General information: <http://www.asor.org> Contact: Dr. Elizabeth Friedman [friedman@iit.edu](mailto:friedman@iit.edu).

26-30 November. MRS Symposium: Materials Issues in Art and Archaeology VIII, Boston, MA USA. Our goal is to present



cutting-edge and interdisciplinary research used to characterize cultural materials; the technologies of selection, production, and usage by which materials are transformed into objects and artifacts; the science underlying their deterioration, preservation and conservation, and the development of sensors and tools for nondestructive in-situ examination of artifacts, as well as innovative analytical technology for their characterization. General information: [www.mrs.org/meetings](http://www.mrs.org/meetings).

28 November-2 December. American Anthropological Association Meetings, 21st Annual Ceramic Ecology Symposium, Washington, D.C. USA. General information: <http://www.aaanet.org/mtgs/mtgs.htm> For more information, contact: Charlie Kolb, [ckolb@neh.gov](mailto:ckolb@neh.gov).

10-14 December 2007. American Geophysical Union Fall Meeting, San Francisco, California, U.S.A. Contact: AGU Meetings Department, 2000 Florida Avenue NW, Washington, DC 20009 USA; Phone: +1-202-777-7335; Fax: +1-202-328-0566; E-mail: [meetinginfo@agu.org](mailto:meetinginfo@agu.org); General information: [www.agu.org/meetings](http://www.agu.org/meetings).

### 2008

3-6 January. Archaeological Institute of America National Meeting, Chicago, IL USA. General information: <http://www.archaeological.org/webinfo.php?page=10096>.

9-12 January. Society for Historic Archaeology, 2008 Conference on Historical and Underwater Archaeology, Albuquerque, NM, USA. Call for Papers: May 1, 2007. Theme: "The Public Benefits of Historical Archaeology." General information: <http://www.sha.org>.

26-30 March. Society for American Archaeology 73rd Annual Meeting. Vancouver, BC Canada. Abstract submission deadline is September 5, 2007 (grace period, September 6-12). All submissions should use the new on-line system. Hardcopy submissions will be charged US\$25. General information: <http://www.saa.org/meetings/index.html>.



## BUDAPEST



2-6 April. 36th Annual Conference on Computer Applications and Quantitative Methods in Archaeology: "On the Road to Reconstructing the Past" Budapest, Hungary. General information: <http://www.caa2008.org>.

6-10 April. 235th National Meeting and Exposition, American Chemical Society, New Orleans, LA, USA. General information: <http://www.acs.org>.

27 April-1 May. American Association of Museums National Meeting. Denver, CO, USA. General information: <http://www.aam-us.org/am/08/index.cfm>.

12-16 May. International Symposium on Archaeometry in Siena, Italy. General information: <http://www.unisi.it:80/eventi/isa2008>.

4-8 June. Cod and Herring: The Archaeology and Early History of Intensive Fishing. Westray, Orkney, Scotland. A workshop of the International Council for Archaeozoology, the History of Marine Animal Populations, the Global Fisheries History Network and the McDonald Institute for Archaeological Research. Contact: [CodHerring2008@mcdonald.cam.ac.uk](mailto:CodHerring2008@mcdonald.cam.ac.uk). General information: [www.mcdonald.cam.ac.uk/CodHerring2008](http://www.mcdonald.cam.ac.uk/CodHerring2008).

29 June-4 July. Sixth World Archaeological Congress. University College Dublin, Ireland. The World Archaeological Congress (WAC) is the only representative, fully international organization of practicing archaeologists. Founded in 1986, WAC encourages open dialogue among all people genuinely concerned about the past. Themes include "Our Changing Planet: Past Human Environments in Modern Contexts," "Archaeology in the Digital Age 2.0," "Developing International Geoarchaeology," and "Wetland Archaeology Across the World." General information: <http://www.ucd.ie/wac-6>.

22-26 September. ICOM (International Council of Museums) Committee for Conservation New Delhi, India. Theme: Diversity in Heritage Conservation: Tradition, Innovation and Participation. General information: <http://icom-cc.icom.museum/TriennialMeetings>.

Department of Anthropology  
University of South Florida  
4202 E. Fowler Ave., SOC 107  
Tampa FL 33620-8100 USA

Non Profit Org.  
U.S. POSTAGE PAID  
Tampa, FL  
Permit No. 257

ADDRESS SERVICE REQUESTED

Please send subscription address changes to SAS Administration

# SAS Bulletin

*Newsletter of the Society for Archaeological Sciences*

## SAS Bulletin Staff

*Editor:* **E. Christian Wells**, Department of Anthropology, University of South Florida, 4202 E. Fowler Ave., SOC 107, Tampa, FL 33620-8100, USA; tel 813-974-2337; fax 813-974-2668; email cwells@cas.usf.edu

*Associate Editor, Archaeological Ceramics:* **Charles C. Kolb**, Division of Preservation and Access, National Endowment for the Humanities, Room 411, 1100 Pennsylvania Avenue, NW, Washington, DC 20506, USA; tel 202-606-8250; fax 202-606-8639; email ckolb@neh.gov

*Associate Editor, Archaeological Chemistry:* **Nora Reber**, Anthropology Program, University of North Carolina, 601 S. College Rd., Wilmington, NC 28403, USA; tel 910-962-7734; email rebere@uncwil.edu

*Associate Editor, Archaeometallurgy:* **Roger C.P. Doonan**, Department of Archaeology, University of Sheffield, Northgate House, West Street, Sheffield, S1 4ET, UK; tel 44(0)11-4222-2939; fax 44(0)11-4272-563; email r.doonan@sheffield.ac.uk

*Associate Editor, Bioarchaeology:* **Gordon F.M. Rakita**, Department of Sociology, Anthropology, & Criminal Justice, University of North Florida, 4567 St. Johns Bluff Rd., South Jacksonville, FL 32224-2659, USA; tel 904-620-1658; fax 904-620-2540; email grakita@unf.edu

*Associate Editor, Book Reviews:* **Stacey N. Lengyel**, Archaeomagnetic Laboratory, Illinois State Museum, Research and Collections Center, 1011 East Ash Street, Springfield, IL 62703-3500, USA; tel 520-721-4309; fax 520-298-7044; e-mail slengyel@srcirm.com

*Associate Editor, Dating:* **Gregory Hodgins**, Physics and Atmospheric Sciences, NSF Arizona AMS Facility, 1118 E. 4th Street, University of Arizona, Box 0081, Tucson, AZ 85721, USA; tel 520-626-3619; fax 520-626-4721; email ghodgins@physics.arizona.edu

*Associate Editor, Geoarchaeology:* **Jane A. Entwistle**, Geography, School of Applied Sciences, Northumbria University, Sandyford Road, Newcastle upon Tyne NE1 8ST, UK; tel 44(0)191-227-3017; fax 44(0)191-227-4715; email jane.entwistle@northumbria.ac.uk

*Associate Editor, Meeting Calendar:* **Rachel S. Popelka-Filcoff**, National Institute of Standards and Technology, 100 Bureau Drive, Stop 8395, Gaithersburg, MD 20899-8395 USA; tel 301-975-4611; fax 301-208-9279; email rachel.popelka-filcoff@nist.gov

*Associate Editor, Remote Sensing and GIS:* **Apostolos Sarris**, Laboratory of Geophysical-Satellite Remote Sensing & Archaeoenvironment, Foundation of Research & Technology Hellas, Melissinou & Nikiforou Foka 130, P.O. Box 119, Rethymnon 74100, Crete, Greece; tel (30)-831-25146; fax (30)-831-25810; e-mail asaris@ret.forthnet.gr

## SAS Administration

*General Secretary:* **Robert Sternberg**, Department of Earth and Environment, Franklin & Marshall College, Lancaster, PA 17604-3003, USA; tel 717-291-4134; fax 717-291-4186; email rob.sternberg@fandm.edu

## SAS Executive Officers, 2007-2009

*President:* **Thilo Rehren**, Institute of Archaeology, University College London, 31-34 Gordon Square, London, WC1H 0PY, UK; tel 44(0)20-7679-4757; fax 44(0)20-7383-2572; email th.rehren@ucl.ac.uk

*Vice President/President-elect:* **Sandra L. López Varela**, Departamento de Antropología, Universidad Autónoma del Estado de Morelos, Av. Universidad 1001, Col. Chamilpa, Cuernavaca, Morelos 62209 México; tel & fax 01-777-329-7082; email slvarela@buzon.uaem.mx

*Past President:* **Aaron Shugar**, Art Conservation Department, Buffalo State College, 1300 Elmwood Ave., Buffalo, NY 14222, USA; tel 716-878-5031; fax 716-878-5039; email shugaran@buffalostate.edu

*SASweb:* **Destiny Crider**, Archaeological Research Institute, Arizona State University, Tempe, AZ 85287-2402, USA; tel 602-965-9231; fax 602-965-7671; email destiny.crider@asu.edu, arleyn.simon@asu.edu

*SASnet:* **James Burton**, Department of Anthropology, University of Wisconsin, Madison, WI 53706-1393, USA; tel 608-262-4505; fax 608-265-4216; email jhburton@facstaff.wisc.edu

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

*Vice President for Membership Development:* **AJ Vonarx**, Department of Anthropology, University of Arizona, Tucson, AZ 85721-0030; tel 520-881-3407; fax 520-621-2088; email ajvonarx@email.arizona.edu

*Publications Coordinator:* **Robert H. Tykot**, Department of Anthropology, University of South Florida, 4202 E. Fowler Ave., Tampa, FL 33620-8100, USA; tel 813-974-7279; fax 813-974-2668; email rtykot@cas.usf.edu

*SAS Editor for Archaeometry:* **James Burton**, Department of Anthropology, University of Wisconsin, Madison, WI 53706-1393, USA; tel 608-262-4505; fax 608-265-4216; email jhburton@facstaff.wisc.edu

*Editor, Archaeometry:* **Mark Pollard**, Research Laboratory for Archaeology and the History of Art, Oxford University, Dyson Perrins Building, South Parks Road, Oxford OX1 3QY, UK; tel 44-(0)1865-285228; fax 44-(0)1865-285220; email mark.pollard@rlaha.ox.ac.uk

*Editor, Journal of Archaeological Science:* **Thilo Rehren**, Institute of Archaeology, University College London, 31-34 Gordon Square, London, WC1H 0PY, UK; tel 44(0)20-7679-4757; fax 44(0)20-7383-2572; email th.rehren@ucl.ac.uk

*SAS Representative on the International Symposium on Archaeometry committee:* **Sarah U. Wiseman**, Program on Ancient Technologies and Archaeological Materials, University of Illinois at Urbana-Champaign, 78 Bevier Hall, 905 S. Goodwin, MC 187, Urbana, IL 61801, USA; tel 217-333-6629; fax 217-333-8479; email wisarc@uiuc.edu

Published quarterly by the Society for Archaeological Sciences

Distributed to subscribers: \$20/yr regular membership; \$15.00 student & retired; \$30.00 institutional; \$300 lifetime. Individuals add \$105.00/yr for *Journal of Archaeological Science*; \$35/year for *Archaeometry*. ISSN 0899-8922.