



SAS Bulletin

Society for Archaeological Sciences

Volume 23 number 3/4

Winter 2000



From the Editor

We bring you this final issue of the Millennium with the news that archaeological science is alive and well, having made major contributions in recent decades to our understanding of past peoples in many important areas. Chronometric dating, including radiocarbon, radiopotassium, and luminescence dating, as well as dendrochronology and obsidian hydration dating, is the most widely applied use of scientific techniques to archaeological problems. Provenance studies, using petrographic, trace element, and/or isotope ratio analysis, have revolutionized our knowledge of trade and distribution patterns of obsidian, chert and flint, greenstones, and marble; of ceramics and glass; of copper, lead and silver metals; and of organic materials including amber, bitumen, and ivory. Materials analysis, using electron as well as optical microscopy, has continued to provide detailed knowledge of the subtleties of manufacturing processes and artifact usage, for example alloying and surface enrichment of metals, and of use-wear and edge damage on a variety of materials. Zooarchaeological and archaeobotanical studies, including the recovery and analysis of macro- and microfauna, macrobotanical remains, pollen, phytoliths, and starch grains, have allowed detailed reconstruction of dietary menus and environmental settings. Bone chemistry analyses have made significant contributions to reconstructing subsistence beginning with our earliest hominid ancestors, to documenting mobility and migration patterns, and to establishing genetic relationships at the individual, family, and population levels. Finally, the use of remote sensing methods including ground penetrating radar and proton magnetometry have helped locate and document subsurface remains while the microscopic and chemical analysis of soils and sediments has allowed us to recreate taphonomic processes and human activities.

Significantly, the contributions of archaeological science or archaeometry are now more widely recognized by colleagues in the humanities and social sciences, while at the same time archaeological applications are more often seen as worthwhile activities for physical scientists rather than something to be done in one's spare time. Archaeometric research is funded by a variety of government and private sources, with funding programs specifically for archaeological science existing in the US, Europe, and Asia. In addition, more

scholars are receiving formal training in both archaeology and science, which has resulted in better research designs, and fuller integration of scientific data with humanistic interpretation. A number of universities, especially in Britain, have either departments or programs in archaeological science.

The Society for Archaeological Sciences was founded in 1977 with 100 charter members; since then, our membership has grown to as many as 700, while sister organizations in several countries have also been established. There are now numerous groups devoted to specific materials, for example the Association for the Study of Marble and Other Stones in Antiquity, the International Association for Obsidian Studies, the Historical Metallurgy Society, and the Society for Phytolith Research. The journal *Archaeometry* was first published in

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CMRAE (MIT) Laboratory Supervisor/Technical Instructor

The Center for Materials Research in Archaeology and Ethnology (CMRAE) at MIT invites applications for the position of Laboratory Supervisor/Technical Instructor at the CMRAE Graduate Laboratory. The Graduate Laboratory is the facility where all CMRAE graduate instruction in the materials science of archaeological materials takes place and where graduate students carry out Ph.D. research in materials and archaeology. Supervisory responsibilities include:

Instruction: one-to-one laboratory supervision and instruction in the materials analysis of archaeological and ethnographic materials; work with faculty in the design and teaching of year-long graduate subjects in materials and archaeology; preparation of laboratory instruction manuals; equipment maintenance and design

Research and documentation: work with faculty/staff on research projects, including opportunity to conduct independent, ongoing research; develop, maintain, and document reference collections of archaeological materials; computer-aided documentation of all procedures.

Applicants must be skilled microscopists, with considerable experience in either or both metallography and work with the polarizing microscope. Expert darkroom skills are required. Teaching experience is essential. Expertise in handling a variety of personal computer programs is required.

Applicants must have the MA/MS degree or equivalent experience. Please send a detailed letter outlining technical and research training and experience and teaching experience, a CV, and the names and addresses (including email addresses) of 3 references before 1 June to:

Professor Heather Lechtman, MIT, Room 8-138, Cambridge, MA 02139.

For information about CMRAE, visit our website: <http://web.mit.edu/cmrae/cmrae_home.htm>

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Nature and Scope of Position

The Center for Accelerator Mass Spectrometry (CAMS) at Lawrence Livermore National Laboratory (LLNL) is seeking a postdoctoral research scientist in terrestrial paleoclimate and paleoecology. The appointment(s) will be made for 2 years initially with the possibility of a 1-year extension.

The overall CAMS mission is the utilization of a wide range of isotopic and ion beam analytical methods to solve problems in basic science research and technology development. Accelerator Mass Spectrometry (AMS) measures rare, long-lived isotopes for research in biomedical, earth, and environmental sciences. Our natural radiocarbon research program is engaged in modern process studies in the terrestrial and oceanic realms documenting and understanding the spatial and temporally varying sinks and sources of CO₂ to the atmosphere. We are also studying natural climate variability in order to develop paleoclimate records with sufficient resolution and time-control to understand the processes governing seasonal to millennial to glacial-interglacial climate change. We work closely with various modelling groups both in-house to LLNL (ASD & PCMDI) and the broader external scientific community, but our primary focus is the acquisition and interpretation of real-world data.

The successful applicant will work within the geosciences radiocarbon group as part of an interdisciplinary team of LLNL researchers and external collaborators. The primary responsibility of this position is to develop experimental programs to explore natural climate variability under different boundary conditions. The main focus will be to use ¹⁴C AMS measurements in conjunction with paleoclimate archives and proxy data to document climate variability in the terrestrial environment. This position requires a recent Ph.D in ecology, biology, geology, biogeochemistry or related field. Experience in sample preparation and interpretation of stable isotope and ¹⁴C analyses is desired.

Applicants will be expected to be able to obtain a P clearance status. Contact:

Center for Accelerator Mass Spectrometry Dept. of Ocean Sciences, UC/LLNL L-397 UC - Santa Cruz, 7000 East Avenue 1156 High Street, Livermore, CA 94551 Santa Cruz, CA 95064. tel 925 422-1753; fax 925 423-7884.

Postdoctoral Research Scientist Terrestrial Paleoclimate and Paleoecology Center for AMS Lawrence Livermore National Laboratory

This is an advance posting of an upcoming position at the Center for AMS, LLNL and as of yet does not have an EV# assigned to it. For those interested, please check the LLNL website in the next few weeks. LLNL now only accepts electronic CVs and applications. We at CAMS however, prefer the old-fashioned method and if you do decide to apply electronically, please send a copy of your CV, cover-letter, and the names of three potential references to us.

International Archaeometry Symposium Abstracts Online

Abstracts of the proceedings of the recent International Archaeometry Symposium in Mexico City are now available on line through the conference web site at:

<http://www.archaeometry.unam.mx/abstracts.html>

and mirrored as “.pdf” files on the SAS web pages at:

<http://www.wisc.edu/larch/sas/iso2000abs.htm>

Research Awards in Archaeology Laboratory for Archaeological Chemistry University of Wisconsin-Madison

The Laboratory for Archaeological Chemistry at the University of Wisconsin-Madison announces the annual winners of research award grants, intended for graduate students in archaeology. The lab strongly believes that many major discoveries in archaeology in future years will come from laboratory investigations. In that light, the training of graduate students in analytical methods and their application is essential. This award is intended to further those goals. The awards are offered to support and encourage the application of chemical analyses in solving archaeological problems. Applications for the annual awards are due January 1 each year. More information on the Laboratory for Archaeological Chemistry and the Research Awards is available at <http://www.wisc.edu/larch/aclab/award.htm>. Awards were made this year for two outstanding proposals:

Stacie M. King, University of California-Berkeley, will analyze sediment samples from prehistoric household in coastal Oaxaca, Mexico, for information on activity areas and household organization, as part of her dissertation research.

E. Christian Wells, Arizona State University, will analyze sediment samples from the plaza area at the site of El Coyote in Honduras as part of his dissertation research. The chemical data will be used to address questions concerning the location of food production, consumption, and deposition in the plaza area of the site.

Center of Excellence for Artifact Analysis Department of Materials Science and Engineering, Lehigh University

A Center of Excellence for Artifact Analysis has been established in the Department of Materials Science and Engineering at Lehigh University. The program will be fully funded as of July of this year, but we already have one graduate student funded by a fellowship from this program. There are two aspects to the program: one is to provide laboratory support to small museums and university archaeology/anthropology groups who do not have normal access to laboratory analysis, or funding to perform this analysis.

The foundation supporting our endeavor will provide funds to us in order to aid groups who are in need of such laboratory assistance. The second aspect of the program is to provide fellowship support to graduate students interested in pursuing research in archaeometallurgy. The first project that has already been started is concerned with materials and fabrication technology for ancient astrolabes.

The second fellowship (which we are now trying to find an applicant for) will be focused on materials and fabrication technology for either pre-Colombian or Asian metals, depending on the interests of the foundation and the applicant. The instrumental emphasis for this project will be the use of a variety of electron microscopy methods (SEM, EPMA, TEM) and surface analytical methods (mainly XPS). The electron microscopy lab at Lehigh has world recognized expertise and leading-edge facilities. Financial support will fully cover stipend and tuition, and is aimed for a two (or three) year graduate research program. If you know of an interested party, please have them send a resume to:

Professor Michael Notis
Department of Materials Science and Engineering
Lehigh University
Bethlehem, Pennsylvania
tel: 1-610-758-4225
fax: 1-610-758-4244
e-mail: mrn1@lehigh.edu

Journal of Archaeological Science IDEAL

Academic Press takes pride in our long standing relationship with the Society for Archaeological Sciences and its members. We know many of you, through your membership dues, receive the printed version of the *Journal of Archaeological Science*. Recently you asked about access to the electronic version of the journals. Some of you are no doubt affiliated with institutions which subscribe to IDEAL, the International Digital Electronic Access Library, and therefore would already have access.

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New Paleoclimate Discussion List

You are cordially invited to help launch the new Paleoclimate list-server, which is designed to provide a forum for Internet discussions and announcements among Paleoclimatologists throughout the world. The list is primarily for use by paleoclimatic researchers and scientists. Of primary emphasis are periods of the recent past where data from the paleoclimatic record are of particular value to the modern climate community. Thus the time periods of primary emphasis are Quaternary, especially the Holocene, although discussions of earlier periods are not discouraged.

Appropriate subjects for discussion might include:

- new proxy and historical data availability
- national and international meetings and symposia
- national and international programs and program news
- funding opportunities
- employment opportunities
- new paleoclimate-related publications
- announcements of paleoclimatology or related courses
- paleoclimate research initiatives
- controversial topics in paleoclimatology
- recent reports on paleoclimate research
- paleo in the news

At this time, this is an unmoderated list and is also available as a weekly digest (see below). However, only subscribers may post messages to the list. We encourage vigorous discussions and controversial topics as well as respectful "netiquette".

To Subscribe to the Paleoclimate-List, please send an e-mail message to listproc@lists.colorado.edu, with the following message (only!) in the body of the text:

subscribe paleoclimate-list <your-full-name>

Example: *subscribe paleoclimate-list Albert Einstein*

We also offer a weekly digest version which you can sign up for immediately by sending listproc@lists.colorado.edu the following message:

subscribe paleoclimate-list <your-full-name>

set paleoclimate-list mail digest

Once you subscribe a more detailed message will be sent to you explaining in more detail the digest options, how to unsub, etc.

If you have any questions, check out Web site at: <http://www.ngdc.noaa.gov/paleo/listserv-invitation.html> or send e-mail to: paleolist.help@noaa.gov.

We're really excited about the potential for this list and welcome your participation and ideas on how to "cross-pollinate" between the many disciplines and backgrounds in the paleo world.

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CALIB 4.3 Released

The latest version has been released of the radiocarbon calibration program CALIB 4.3 for Windows. The program can now handle up to 3000 samples. Printing of the graphics has also been simplified. The program can be downloaded from our new Internet site <http://www.calib.org/>. Please follow the CALIB link to the downloadable versions and note the instructions for downloading and decompressing the Windows version there. A Macintosh version for G3/G4 platforms is also available.

A marine reservoir correction database has also been developed, funded by the Institute for Aegean Prehistory. The database is also accessible at www.calib.org and is intended for use with radiocarbon calibration programs.

Digital Archaeological Map

Apostolos Sarris, Associate Editor

The Laboratory of Geophysical - Satellite Remote Sensing & Archaeo-environment of the Institute for Mediterranean Studies (Foundation of Research & Technology, Hellas - FORTH) has created a Digital Archaeological Map of Lasithi District, East Crete, which is available on the web: <http://www.l.ims.forth.gr/ArchGeolab/ArchLasithi/html-end/html-map-page1.htm> or directly to the map: <http://www.l.ims.forth.gr/maps/website/imslasithi2001>

The website operates in a GIS environment that integrates topographic, geological and landuse maps, SPOT and Landsat images. More than 900 sites have been registered in the map. About two hundred have been accurately mapped with GPS units. The website is accompanied by an archaeological data base (that includes bibliography and photos), which can operate independently of the GIS-based map. One has the ability to search the database and print out reports for all the sites registered in it. You can also make you own contribution of data (new entries) which will be used for the renewal of the data in the future.

Your feedback is always welcome to help us improve and enhance the website.

Luminescence and Electron Spin Resonance Dating

Jack Rink, Associate Editor

Since the advent of thermoluminescence dating of archaeological ceramic materials in the 1960's, great advances have taken place in the use of radiation exposure dating for archaeological and anthropological samples. Dating of the time of last light exposure of sediment grains has moved on from

the thermoluminescence technique in the 1970's to that of optical luminescence dating in the 1980's and 1990's, which has led to great improvements in both the resolution and accuracy of luminescence dating. Known-age samples as young as 100 years have now been dated securely, extending the time range of the method to below that of the radiocarbon method, while the long-range limit is generally about 300 to 400 thousand years. Tooth enamel and carbonate materials are now routinely used to determine the burial age of their host sediments using the electron spin resonance technique, with a dating range of between about 10,000 and 300,000 years for carbonates (e.g. mollusc shell) and between about 10,000 to 2,000,000 years for tooth enamel. The great value of all of these techniques is that they can be used where volcanic materials are absent beyond the 40,000 year long-range limit of radiocarbon, and that they can be used to calibrate geomagnetic polarity timescale studies of sediments.

10th International Conference on Luminescence and Electron Spin Resonance Dating

New developments in the application of electron spin resonance and luminescence dating in the field of archaeology will be a highlight of an upcoming conference that is open to all, and which is being held for the first time ever in North America. The Desert Research Institute invites you to the *10th International Conference on Luminescence and Electron Spin Resonance Dating* (LED 2002), to be held at the University of Nevada-Reno, in Reno, 24-28 June, 2002. LED 2002 continues the series begun in 1978 in Oxford, U.K., and follows LED99 (Rome, 1999), and LED96 (Canberra, 1996).

LED 2002 will bring together experts from around the world in the field of trapped-electron dating (luminescence and electron spin resonance dating). The topics range from novel and original applications to the dating of heated and unheated Quaternary geological/geomorphological and archeological materials, through fundamental studies of the basic physical phenomena and related dosimetry, to advances in equipment technology.

All interested persons can access information at the conference WEB site, <http://www.dri.edu/DEES/LED2002/led2002-home.html>.

International Symposium on New Strategy of ESR Dosimetry and Dating *October 25-27, 2001 at Osaka University, Japan*

The fields of electron spin resonance (ESR) dating, radiation dosimetry and imaging have progressed remarkably in the last two decades. We think it a good occasion to summarize the quarter century of ESR dating and half a century of ESR dosimetry, especially after the book "New Applications of Electron Spin Resonance-Dating, Dosimetry and Microscopy" (World Scientific, Singapore, 1994) and discuss the strategy at the start of 21st century to stimulate our fields.

The 3rd Asia-Pacific EPR symposium will be hosted by Dr. Kawamori at Kansei Gakuin University and will be held

at Kobe University from October 29-November 2, 2001. There is a session on ESR dosimetry and earth science applications. Hence, if you could participate in this Symposium or if you had a chance to come to Japan, it is good to attend a satellite EPR dosimetry symposium meeting organized by ESR Applied Metrology Workshop in Osaka.

Background

The First International Symposium on ESR Dating including dosimetry was held in 1985 at Ube-Akiyoshi and supported by Technical College of Yamaguchi University under the auspices of the Ministry of Education, Japan. The second and fourth was at GFS, Germany, the third at NIS, USA and the fourth, Russia. There were requests that the fifth should be held at Osaka University, but the sixth is scheduled at Denver, Colorado, USA with the emphasis on biodosimetry.

The Japanese Workshop of ESR Applied Metrology, in which researchers of optical dating are also participating, will host the symposium by inviting a small number of young researchers and students from abroad. The selection will be made from the quality of the submitted abstract. However, the budget is extremely tight. We are not sure whether we can get any support from agencies at the time of drastic changes of university system in Japan. Hence, participants are requested to apply their travel grant and stipends from their own countries in principle. We do our best to help excellent researchers having financial. There will also be an Abstract Prize which covers the full or partial travel expenses to present the work in Osaka.

We have decided not to have a big formal International Symposium, but to have an open forum to highlight ESR dosimetry and applications to interdisciplinary fields. This should be an informal, scientifically pleasant and stimulating, get-togetherness type two and half days symposium before the 3rd Asia Pacific EPR/ESR Symposium. The session of the ESR dating and dosimetry in the Asia Pacific Symposium will be arranged for your convenience.

Scope of the Symposium

Technical details of ESR dating, dosimetry and some imaging and their noble applications are main subjects in this symposium. Works on optical dating will be mostly presented in poster sessions. However, noble works especially done with ESR will be presented in the oral session. New approaches for identification of irradiated foodstuffs by EPR Followings are the main topics of the symposium.

- 1) Tokai JCO, Chernobyl accidents and A-bomb radiation. Special lecture on JCO accident and its dosimetry, Chernobyl, Semipalachinsk, etc.
- 2) Radiation effects of minerals and basic studies on waste depository in sediments. What ESR and optical methods can do to assess the safety of radioactive waste.
- 3) ESR and optical dating in geosciences toward 21st century. Summary of ESR & Optical dating in geosciences in 20th century and new prospects.
- 4) ESR and optical dating and dosimetry in planetary sciences. Dosimetry in space missions for astronauts and noble methods in planetary material survey

- 5) ESR imaging and new spectrometers with applications from semiconductors to fossils. Review of ESR imaging hardware and their applications for interdisciplinary studies
- 6) New materials ESR dosimeters and for food irradiation monitoring. Tissue equivalent alkali-organic acids compounds for dosimeter and new methods of monitoring.

We recommend you to participate in the Asia-Pacific in which some general review talks on ESR dosimetry and dating are also scheduled. If you are interested to participate in this symposium and the 3rd Pacific EPR Symposium, please let us know by reply e-mail. Deadline for the application to abstract prize: July 15, 2001. Deadline for the submission of abstract: August 31, 2001.

Address

2001 International Symposium on ESR Dosimetry and Daring (Oct.25-27, 2001) Society of ESR Applied Metrology, Department of Earth and Space Science, Osaka University, 1-1 Machikaneyama, Toyonaka, Osaka 560-0043, Japan, Prof. Motoji Ikeya.tel +81-6-6850-5490; fax +81-6-6850-5540; email: ESRDD@ess.sci.osaka-u.ac.jp; web: <http://pumice.ess.sci.osaka-u.ac.jp/esrdd/>

SAS Symposia at the Society for American Archaeology

Resolution & Refinement: Leading Edge Research in Archaeological Chemistry

The SAS-sponsored symposium 'Resolution & Refinement: Leading Edge Research in Archaeological Chemistry' will take place Sunday morning, April 22, at the 66th annual meeting of the Society for American Archaeology in New Orleans. The session is co-organized by Kelly Knudson (University of Wisconsin at Madison) and David Meiggs (University of Wisconsin at Madison). T. Douglas Price (University of Wisconsin at Madison) and Robert Tykot (University of South Florida) will serve as discussants for the ten papers that will be presented in the session.

Over the past twenty years, archaeological chemistry has become an increasingly valuable sub-discipline in archaeology, aided by greater access to instrumentation, the development of novel techniques—like organic residue and strontium isotope analysis—and smaller sample sizes. While the greater sensitivity and analytical power of such techniques are undeniable, this symposium will focus on the ways in which diverse approaches are providing greater resolution and increasingly refined data to answer archaeological questions. More specifically, emphasis will be on the use of innovative techniques to illuminate a more refined scope in archaeological research or obtain greater resolution in an archaeological problem by application of an established technique in a novel way. The participants in this symposium will describe current state-of-the-art research in archaeological chemistry and hopefully stimulate discussion on the continuing, unique contributions of archaeological chemistry to the knowledge of ancient cultural dynamics.

The papers to be presented are as follows: 'Identifying Chemical Activity Residues on Prehistoric House-floors: A Methodology and Rationale for Multi-Elemental Characterization of Anthropogenic Sediments' (William D. Middleton, The Field Museum of Natural History), 'Scanning Electron Microprobe Analysis of Ceramic Clay Fractions and Clay-Rich Sediments from the Malpaso Valley, Northwest Mexico' (Christopher P. Garraty and E. Christian Wells, Arizona State University), 'Reconstructing Trade and Interaction in Oceania with Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) of Lapita Ceramics' (Michael Cruz and Douglas J. Kennett, California State University-Long Beach, and Atholl Anderson, Australian National University), 'How Did Mississippians Prepare Maize?: A Compound Specific Carbon Isotopic Study of Absorbed Pottery Residues from Several Mississippi Valley Sites' (Nora Reber, Harvard University, and Richard Evershed, University of Bristol), 'The Potential of Fatty Acid Profiles to Distinguish Different Species of African Rices and Trace Its Domestication' (David Meiggs and Shawn Murray, University of Wisconsin at Madison), 'The Use of Alkaline Earth Ratios in Human Skeletal Tissues to Determine Geographical Origins' (James H. Burton and T. Douglas Price, University of Wisconsin at Madison, Lori Wright, Texas A&M University, and Peter Rank, University of Wisconsin at Madison), 'Tiwanaku Residential Mobility as Determined by Strontium and Lead Isotope Analysis' (Kelly Knudson and T. Douglas Price, University of Wisconsin at Madison, Jane E. Buikstra, University of New Mexico, and Deborah Blom, Vanderbilt University), 'Lead Isotopes in Skeletons from Early Neolithic Germany' (R. Alexander Bentley, T. Douglas Price, and James H. Burton, University of Wisconsin at Madison), 'Stable Carbon, Nitrogen and Sulphur Isotope Evidence of Human Mobility in Prehistoric Europe' (Michael P. Richards, University of Oxford), and 'Stable Nitrogen Isotopes Reveal the Age of Weaning and Growth Events at the Medieval Site of Wharram Percy, England' (Benjamin T. Fuller, Michael P. Richards, and Simon Mays, University of Oxford).

Cultural Resource Management and Archaeometry: Entering the Mainstream

A poster symposium entitled "Cultural Resource Management and Archaeometry: Entering the Mainstream," organized by Michael D. Glascock and Robert Speakman and sponsored by the SAS, will be held at the SAA Annual Meeting on Friday afternoon April 20, 2001 from 1:00 to 5:00.

The posters include: Geological Constraints on Stone Tool and Debitage Morphology at the Sage's Crossing Site, Unadilla Valley, New York (Carol A. Raemsch, Hartgen Archeological Associates, Inc. and Philip C. La Porta, La Porta & Associates, Geological Consultants); The White and the Gray: Geochemical Analysis of Midwestern Chert (Robert Speakman, University of Missouri, Michael D. Glascock, University of Missouri, and Jack Ray, Center for Archaeological Research, SMSU); Landsat Thematic Mapper as a Regional Mapping Tool in the West Saddle Mountains, Grant County, Washington (Daniel Alden, Central Washington University and Patrick McCutcheon, Central Washington University); Archaeometry and Cultural Resource Management at Mount Rainier National Park (Steve

Dampf, Trina Amadisto, and Patrick McCutcheon, Central Washington University); Archaeometric Techniques for Pedestrian Survey in the Saddle Mountains, Central Washington. (Tucker Orvald, Central Washington University); Archaeometry to the Rescue at Bone Cave: The Interpretation of a Severly Disturbed Lava Tube Site in Central Oregon (Jeffrey Ferguson, University of Colorado, Boulder); Geochemical Sourcing of Obsidian Artifacts to Support CRM (Candace A. Sall, Michael D. Glascock, and Robert Speakman, University of Missouri); Pots from Down the Road: Investigating Kayenta Anasazi Ceramic Production and Exchange with Electron Microprobe Analysis (Kimberly Spurr and Phil Geib, Navajo Nation Archaeology Department, and James Wittke, Northern Arizona University); Application of Luminescence Dating in CRM Projects (Mustafa Aksel Casson and James K. Feathers, University of Washington); Rock Magnetic Approaches to Archaeological Investigations (William C. Johnson, University of Kansas); The Use of Neutron Activation Analysis in the Development of Regional Contexts for Archaeological Sites in Western Pennsylvania (Beverly Chiarulli, Indiana U of Pennsylvania, Paul Raber, Heberling Associates, Christopher M. Stevenson, Virginia DOT, and Michael D. Glascock, University of Missouri); Illinois/Chiwere Siouan Interaction in the Late Protohistoric Midcontinent (Kathleen L. Ehrhardt, New York University, Larry D. Grantham, Missouri Department of Natural Resources, and Robert Speakman, University of Missouri); Prehistoric Quarry Landscapes and Cultural Resource Management (Linda Sohl, Lamont-Doherty-Earth Observatory, Philip La Porta, Graduate Center, City University of New York, and Margaret Brewer, University of Kentucky); Instrumental Neutron Activation Analysis on Sherds Recovered from South-Central New Mexico: The Pinon Data Recovery Project (Mark C. Slaughter and Chris Lowry, Geo-Marine, Inc.); and Chemical Analyses of Some Cultural Sediments from Cultural Resources Management Projects in the eastern United States (Donald Thieme, Geoarchaeology Research Associates).

From the Editor (continued)

1958, and beginning in 2001 will appear quarterly (and for the first time on-line). The *Journal of Archaeological Science* was established in 1974, and now has 12 issues per year. More specialized journals devoted to scientific applications in archaeology include *Radiocarbon* (1959-); *Geoarchaeology* (1986-); *Archaeological Prospection* (1994-); and *Ancient Biomolecules* (1997-).

In addition to journal publications, there has been a steady stream of books devoted to archaeological science in recent years. Many of these have been conference proceedings, including five volumes from the Archaeological Chemistry symposia held at American Chemical Society meetings; five volumes from the Materials Issues in Art and Archaeology symposia held at Materials Research Society meetings; three

from the Archaeological Science conferences in Britain; seven from the Italian Archeometria meetings; five from the Australasian Archaeometry meetings; and at least a dozen from the International Symposia on Archaeometry. A number of archaeological science texts have appeared since Michael Tite's landmark 1972 publication *Methods of Physical Examination in Archaeology*, including Leute's *Archaeometry: An Introduction to Physical Methods in Archaeology and the History of Art* (1987); Pollard and Heron's *Archaeological Chemistry* (1996); Rapp & Hill's *Geoarchaeology: The Earth-Science Approach to Archaeological Interpretation* (1998); Herz & Garrison's *Geological Methods for Archaeology* (1998); Julian Henderson's *Science and Archaeology of Materials: An Investigation of Inorganic Materials* (2000), and forthcoming in 2001, Goldberg, Holliday and Ferring's edited volume *Earth Sciences and Archaeology*, and Brothwell and Pollard's edited volume *Handbook of Archaeological Sciences*. Nearly all of these publications have been - or will be - reviewed in the *SAS Bulletin*. Many other monographs, edited volumes, and conference proceedings have been published on specific materials or topics, including dating methods, ceramics, metals, glass, obsidian, chert and flint, marble, phytoliths, shells, zooarchaeology, bone chemistry, organic residues, DNA, geoarchaeology, soils, and remote sensing. SAS has published five volumes in our own *Advances in Archaeological and Museum Science* series, and are actively seeking new proposals and manuscripts (please contact one of the editors).

There are now so many conferences either devoted to or with specific sessions on scientific applications in archaeology that it is not possible to attend them all. Besides the many more narrowly focused meetings and symposia listed in our 2001 Calendar are the 8th Giornata "Le Science della Terra e l'Archeometria (Rome, February 22-24); Archaeometry in Europe in the Third Millennium (Rome, March 29-30); the Archaeological Chemistry Symposium, held approximately every five years at the American Chemical Society Meeting (Chicago, August 26-30); the annual British meeting, Archaeological Science 2001 (Newcastle upon Tyne, August 29-September 1); the multi-day Archeometry theme session of the International Union of Pre- and Protohistoric Sciences, held every five years (Liege, Belgium, September 2-8); and the multi-day symposium Materials Issues in Art and Archaeology VI, held at the Materials Research Society Fall Meeting, also about every five years (Boston, November 26-30). With some university travel support, and the newly adjusted dates of the Newcastle meeting so that it doesn't overlap with UISPP, I expect to participate in the last four.

With all this research, publication, conference, and educational activity, it is impossible for most archaeologists and archeometrists to keep up. The SAS provides an important role by announcing meetings, reviewing relevant publications and important conferences, publishing laboratory profiles and research reports, and otherwise serving as a clearing house of information through our *Bulletin*, our website, and the SAS-net listserv. But we need your help. Please send us your news, including faculty, post-doctoral, and student job listings,

conference announcements, funding opportunities, etc. Forward us an occasional report of your research activities, laboratory report, or a short review of a conference or symposium you recently attended. Also send us announcements and requests for books to review - and volunteer to review them.

I anticipate seeing many of you in 2001. When I do, I may make a more personal request for you to contribute in some way, so be prepared. With best wishes for the new millennium,

Robert H. Tykot, Editor

Call for Papers: Archaeological Science 2001

The Archaeological Science 2001 conference will be held 29th August - 1st September 2001 at the University of Newcastle upon Tyne, UK. Details of the conference and a preliminary programme can be found at: <http://www.ncl.ac.uk/geography/conference/conference.html>. Registration forms (PDF) can be downloaded from the website. For further details contact: m.collins@ncl.ac.uk.

Call for Papers: Materials Issues in Art and Archaeology VI

The Fall 2001 Meeting of the Materials Research Society, Nov. 26-30th, Boston, MA, USA, will feature a symposium (no. II) on Materials Issues in Art and Archaeology. Studies are solicited that use the methods and techniques of materials science and engineering to understand the degradation, and promote the long-term preservation, of material culture, i.e. works of art, culturally significant artifacts, and archaeological remains and sites. Preserving cultural heritage extends beyond artifact preservation to developing a critical understanding of how ancient people used technology and craft to solve problems of survival and organization and to make symbols or representations of what was important in their world, especially for its maintenance, longevity and beautification. Paper contributions of empirical studies are solicited that:

- * Reconstruct and interpret ancient technologies, especially through studies of workshop and industrial remains (archeomaterials)
- * Study the nature and diversity of the ancient landscape as a background to human cultural evolution through analysis of residual physical traces (biogeochemistry),
- * Recreate an understanding of the environment, resources, and other constraints on the practice of technologies (resource survey, site catchment analysis and site formation analysis),

- * Characterize the cultural context and the knowledge necessary and sufficient to practice, innovate and transmit know-how for individual cultural survival and achievement (science, technology and society),
- * Apply new, cutting-edge methods or old techniques of analysis in new ways to material cultural problems (archaeometry),
- * Promote an understanding of degradation, weathering and corrosion that leads to stabilization and long-term preservation of material culture (conservation science),
- * Present successful experiment that incorporate studies of ancient technical know-how into modern K-12 and university curricula (ancient materials outreach).

On the last day of the conference, a Pyrotechnology Workshop and Demonstration is planned in which experiments will be conducted in the 3500-year-old technologies of Egyptian faience, faience inlay, glass core vessel manufacture, and the technologies of iron smelting and glassblowing. The latter experiments are to be framed in a 2000-year old Roman period context.

Submission Procedure

Submit abstracts and register at www.mrs.org/meeting/fall2001/ between May 19 and June 19th, 2001. If you have questions, you may pre-email your abstract to: vandiver@scmre.si.edu

If you are unable to access electronic submission, the deadline for abstracts submitted via fax or mail is June 5th. Fax to both Vandiver at (301)238-3700, and MRS at (724) 779-8313. The MRS address is Materials Research Society, 506 Keystone Dr., Warrendale, PA 15086-7573 USA, Tel 724-779-3004.

Publication Procedure

Nov. 12th is the deadline for electronic paper submission. Papers generally are 6 pages, but because of the interdisciplinary nature of this topic and the desirability of multi-faceted interpretation, papers twice that length will be entertained. Instructions will be posted on the website, but at least one figure should show the objects being presented, and another their archaeological context, if possible. Contact Vandiver if your paper requires color, or if you are willing to act as a reviewer.

Symposium Organizers

Pamela B. Vandiver and Martha Goodway, Smithsonian Center for Materials Research and Education, 4210 Silver Hill Rd., Suitland, MD 20746, USA email: vandiverp@scmre.si.edu; goodwaym@scmre.si.edu; tel (301) 238-3700 x-162 or x-164; fax (301) 238-3709.

Jennifer Mass, SUNY Buffalo, Art Conservation Dept., Rockwell Hall 230, 1300 Elmwood Ave., Buffalo, NY 14222 USA; email: massjl@bscmail.buffalostate.edu; tel 716 878-5025; fax 716 878-5039

James R. Druzik, The Getty Conservation Institute, 1200 Getty Center Dr., Los Angeles, CA 90292 USA; email jdruzik@gett.edu; tel 310 440-6825; fax 310 440-7711.

Call for Papers: New Discoveries from Materials Science in the Archaeology of the Near East

Paper proposals are requested for this session of the annual meeting of the American Schools of Oriental Research (ASOR), to be held in Boulder, Colorado, November 14-17, 2001. This session welcomes submissions in which materials science techniques are used to assist in the interpretation of the archaeological record. Papers should focus on the archaeological problem, the technique(s) selected to investigate the problem, the data acquired, and how the results are used within the archaeological context. Studies on both organic and inorganic remains will be considered, especially those that deal with issues of environmental change, ancient technology, trade patterns, demography, and subsistence.

One session is planned for 4-6 speakers. Papers will be limited to 20-25 minutes.

Session Chair: Elizabeth S. Friedman, Ph.D., University of Chicago. email: esf1@midway.uchicago.edu

Abstracts are limited to 250 words and should be emailed to the session chair. Deadline for abstracts is April 1st, 2001 but the session chair would welcome them sooner. Abstract, participation, ASOR membership, and pre-registration forms are all available on-line at <http://www.asor.org>

Call for Papers: 33rd International Symposium on Archaeometry 22-26 April 2002, Amsterdam

The Archaeometry symposium will be held for the first time in the Netherlands and the symposium certainly will be a stimulus for the development of archaeological science in the Netherlands. The local organizing committee is looking forward to meeting a large number of colleagues in Amsterdam. The symposium will be organized by the Vrije Universiteit (VU) at Amsterdam and the Rijksdienst voor het Oudheidkundig Bodemonderzoek (ROB, National Institute for Archaeological Heritage Management) at Amersfoort.

Venue

The symposium will be held in Amsterdam in the Main Building of the Vrije Universiteit. The VU is located in the southwestern part of Amsterdam, close to Schiphol International Airport and symposium hotels. There are good railway/bus/tram and metro connections between VU, the old town centre, the hotels and the airport.

Sessions

The symposium has seven sessions (no parallel sessions). Six of them are regular, while a seventh theme session is selected by the local organizing committee. An afternoon break with an excursion is planned in the middle of the symposium.

The titles of the regular sessions are as follows: Field archaeology (geoarchaeology and prospection); Dating (organic and inorganic materials); Biomaterials (bone, residues, etc.); Technology and provenance I (stone, plaster and pigments); Technology and provenance II (ceramics and glass); Technology and provenance III (metals).

Theme Session

Especially in northwestern Europe the scientific study of the in situ preservation of archaeological heritage has become a major issue. Work in this field of conservation studies is subsidized by national and international research bodies and it can safely be assumed that the number of studies in the field will increase and will be performed world-wide. The title of the theme session is: Conservation studies (science and the in situ preservation of archaeological heritage).

Excursion

During the excursion participants will be informed with the state of art of Maritime Archaeology in the Netherlands. It includes a visit to the conservation laboratories of the Institute for Maritime and Ship Archaeology and a visit to a replica of the Dutch East Indiaman Batavia and its wharf.

Amsterdam

Amsterdam, the capital of the Netherlands, is popular throughout the world and is the most harmonious yet varied city of the Netherlands. The 702,000 inhabitants, 550,000 bicycles and 6,800 historic buildings give the city an unique style and character. It is famous for its canals (160 with 1,281 bridges, 2,394 houseboats), gabled houses, museums (22 Rembrandt and 206 Van Gogh paintings) and of course its atmosphere. Amsterdam's old town centre is very compact. The museums, monuments, markets, shopping street and other attractions are generally within walking distance of each other and are all within a few minutes by public transport from the symposium venue. Amsterdam also offers a wide variety of theatres, music halls, etc. in which you can enjoy all kinds of cultural activities.

Committee of Honour

The Symposium is supported by the institutional world of Dutch archaeology which is represented in the Committee of Honour by Mrs H. van der Linden (Director ROB), Prof. R. Reinders (Chairman Dutch Research School for Archaeology, ARCHON), Prof. N.G.A.M. Roymans (Head of Archaeology Department, VU), Prof. W. Roeleveld (Dean of Faculty of Earth Sciences, VU).

Funding/Sponsoring

The main sponsors of the Symposium are the Vrije Universiteit at Amsterdam (Faculty of Arts, the Archaeological Institute and the Faculty of Earth Sciences) and the Rijksdienst voor het Oudheidkundig Bodemonderzoek (Amersfoort). At this moment the following institutes have agreed to support Archaeometry 2002 by manpower and/or direct financial funding: RAAP consultancy, Amsterdam (private company in prospective archaeology) Dutch Centre for Dendrochronology

(RING), Amersfoort: Faculty of Archaeology, University of Leiden Archaeological Institute, University of Groningen.

Language

The official symposium language will be English.

Registration

The registration fees are (approximately) as follows: Early fee 250 Euro; late fee 300 Euro; student early fee 125 Euro; student late fee 150 Euro. These fees include coffee/tea and a simple lunch. Prices for the Symposium banquet are 40 Euro (30 Euro for students).

Grants for Overseas Participants and Students

Grants for overseas participants and for participants from the former Soviet Union and some Balkan states are not available yet. However, the organizers hope to be able to provide limited financial aid to researchers who can prove financial hardship. With regard to archaeometry students the organizers can, apart from the reduced fee, be helpful in finding the cheapest way of accommodation.

Hotels

The organising committee has arranged hotels in different price categories with travel agent Carlson Wagonlit Travel. Most hotels are conveniently located in the central or southern part of Amsterdam and are all of international standard. People who want to reserve cheaper accommodation can book an apartment or a student room in a University Guesthouse or find their own accommodation. Further information follows in the Second Circular and will be available on the conference website.

Social Program

Social events being planned include a reception given by the city council of Amsterdam, while the excursion will merge into a buffet. The symposium banquet will be organized somewhere in the old town centre of Amsterdam. There is no specific partner programme; however sight-seeing tours for partners and participants in and around Amsterdam during and just after the conference will be arranged on demand.

Symposium Proceedings

Proceedings of the symposium will not be produced. An exception probably will be made for the theme session on science and the preservation of archaeological heritage.

Prizes for Best Student Posters

To encourage the active participation of students in the Archaeometry Symposia, the Standing Committee offers two Martin Aitken prizes of \$100 US each for the best posters representing the work of students enrolled in programs leading to degrees in science or archaeological science. The Society for Archaeological Sciences also offers two prizes for the best student posters, which consist of annual membership in the SAS including subscriptions to *JAS* and *Archaeometry*. Students must attend the symposium to claim their prizes. If you wish to

apply see the next circular and future announcements on the conference website and in the *SAS Bulletin*.

Key Dates

Second Circular with Registration Forms and Call for Papers: May/June 2001; Deadline for submitting Abstracts: 1 November 2001; Notification of acceptance or rejection: January 2002; Deadline for early registration and hotel reservation: 1 February 2002.

For further information: E.A.K. Kars, Rikjsdienst voor het, Oudheidkundig, Bodemonderzoek, PO Box 1600, 3800 BP Amersfoort, the Netherlands. Tel 31 33 422 76 06; fax 31 33 422 77 99; email: e.kars@archis.nl; web: www.archaeometry.vu.nl



Archaeological Ceramics

Charles C. Kolb, Associate Editor

The column in this issue of the *SAS Bulletin* includes six topics: 1) summaries about new books related to archaeological ceramics, 2) journals and articles 3) Oriental ceramic news 4) maritime archaeology: ceramics from shipwrecks, 5) professional meetings held, 6) forthcoming professional meetings, 7) museums and exhibitions, 8) bibliographies, and 9) websites.

New Publications: Books

The prolific scholar of material culture, Henry H. Glassie, College Professor of Folklore and Co-director of Turkish Studies at Indiana University has recently prepared a volume for publication entitled *The Potter's Art* (Bloomington: Indiana University Press, 1999; 152 pp., ISBN 0-253-33732-1, \$25.00, cloth; ISBN 0-253-21356-8, \$12.95, paper). This book, designed by the author and illustrated by his own photographs, has 60 black-and white images and 16 color plates, and is accompanied by Acknowledgments, Notes (90 endnotes), a 51-item Bibliography, and a five-page Index. *The Potter's Art* is the first in a series of books on material culture co-published by Material Culture of Philadelphia and the Indiana University Press. The book is an expanded version of the fourth chapter of Glassie's *Material Culture* (Bloomington: Indiana University Press, 1999, pp. 143-226) published in August 1999. The volume is an ethnographic report that is also an essay on the nature of art (especially ceramic art) and a demonstration of how art may be studied cross culturally. In this book, Glassie brings to the reader a group of modern ceramic artisans, modern masters of traditional ceramic manufacture from the United States, Sweden, Turkey, Bangladesh, and Japan. He seeks to inform us about the potters' techniques and tastes, their ideas about beauty and significance, and cooperation in the midst of other life activities, and thereby illustrate the personal and the social, the useful and beautiful, and the material and spiritual aspects of this art. Glassie is the author of three other volumes published

by Indiana University Press: *Turkish Traditional Art Today* (1993, 962 pp., 1061 black-and white photos, 13 color plates, 6 maps, ISBN 0-253-32555-2, \$89.95, cloth), *Art and Life in Bangladesh* (1997, 520 pp. 445 black-and-white photos, 12 color plates, ISBN 0-253-33291-5, \$49.95, cloth), and the aforementioned *Material Culture* (1999, 416 pp., 170 black-and-white photos, 16 illustrations, ISBN 0-253-33574-4, \$29.95, cloth).

There are nine sections in Glassie's latest volume. The first, "The Potter's Art," provides an introduction and background to his assessment, and is followed by a chapter entitled "Bangladesh" in which Glassie discuss a craft-caste, the Pals, also profiled in greater detail in Chapter 6 of *Art and Life in Bangladesh*. The craft production of *kalshis* (earthenware water vessels) is contrasted with the fabrication of *murtis* (painted clay images of deities which are "vessels with sacred power." "Sweden" profiles Lars Andersson of Raus in Skane, Sweden. In the subsequent chapter, "Georgia," he considers the production of ash-glazed stoneware face jugs at the Meaders Pottery at Mossy Creek and the Hewell Pottery in Gillsville, Georgia. With "Acoma" Glassie reviews the harsh environment of the American Southwest and notes that 300 potters in 13 pueblos make "storyteller" figures, partly influenced by tourism. A major section is devoted to "Turkey" and is a distillation of some elements in Glassie's *Turkish Traditional Art Today*, Chapters 14-17. A shift from the utilitarian to the ornamental production is seen with small atelier shops producing polychrome painted mosque tiles and plates. The aesthetics of decoration is considered, with balance seen as the key to design. In "Japan" Glassie considers the history of Arita porcelain, in the main tableware (plates, bowls, and cups), and informs us of 170 workshops in the Arita area. "Hagi" is a style and area of western Honshu where 200 shops produce *yaki* (statues) and tea vessels (tea bowls, tea canisters, and containers for incense, fresh water, and flowers). Glassie's final essay is entitled "Work in the Clay," in which he confides that "I am not a potter, I am a folklorist, a student of ceramics because pottery is a more universal democratic medium than painting, a better place to search for the world's excellence. I have become an admirer of the sincere worker with clay. I envy the options of the modern potter" (p. 119). He notes that traditional art may flourish in a poor country (Bangladesh), a prospering nation (Turkey), or a rich country (Japan). Indiana University Press, is located at 601 North Morton Street, Bloomington, Indiana 47404-3797 has a website at <http://www.indiana.edu/~iupress> Orders may be submitted via telephone 800/842-6796 or by e-mail: iuporder@indiana.edu

Ronald Duncan (Anthropology, Oklahoma Baptist University, Shawnee, OK) is a researcher and consultant on gender issues, arts and crafts, and economic change in Latin America. He is the author of *The Ceramics of Raquira, Columbia: Gender, Work, and Economic Change* (Gainesville: University Press of Florida, 304 pp., 40 b/w photos, 3 drawings, 3 maps, 11 tables, 1 appendix, glossary, bibliography, index, 1998; ISBN 0-8130-1615-0, \$49.95, cloth) and has recently written a companion volume entitled *Crafts, Capitalism, and Women: The Potters of La Chamba, Colombia* (Gainesville: University Press of Florida, 280 pp.,

27 b/w photos, 2 drawings, 3 maps, 10 tables, glossary, bibliography, index, 2000; ISBN 0-8130-1774-2, \$59.95, cloth). His 1998 volume focused on the technical and socioeconomic aspects of ceramic manufacture in Raquira, Colombia where two pottery-making styles coexist, and he documents how with the advent of capitalism males attained gender power to bring about significant, permanent transformations in a centuries-old women's ceramic tradition that emphasized Spanish customs and the use of molds and potter's wheels. The men control the capital and become the marketers for the products produced by their wives, hence, many women become assistants to their husbands in this dynamic economic enterprise. This solid village ethnography is a significant contribution to ceramic ethnoarchaeology and he illustrates how individuals, families, and communities respond to personal and economic change.

Duncan's latest volume on the women potters of La Chamba shows how grandmothers fabricate traditional cooking vessels, mothers make utilitarian bowls for sale to urban families, and daughters create one-of-a-kind art pieces on special order for export to Europe and the United States. He argues that the treatment of home-based women and children craft workers that occurs in La Chamba (and other areas of Latin America) is structurally similar to slavery and indentured servitude. In spite of being a part of a "global economy" the women receive minimal compensation for their labors. This is a compelling, comprehensive description and analysis of the traditions, socioeconomic parameters and ceramic styles found in a contemporary pottery-making community located in an understudied region of Latin America. The author's impressive documentation of the cultural and economic changes occurring in La Chamba provides an especially valuable assessment useful to students of anthropology, craft technology, economics, history, gender studies art history, and cultural dynamics, as well as ceramic studies. Duncan's descriptions of indigenous technologies and the use of beehive kilns (Chapter 10) are especially valuable. His studies of pottery producing communities in Colombia parallel those of Dean Arnold in Ticul, Yucatan, Mexico and in Andean communities. Both scholars document technological and socioeconomic changes that are valuable to ceramic ethnoarchaeology. The University Press of Florida (15 NW 15th Street, Gainesville, FL 32611-2079, 1-800/226-3822) has a website with Shopping Cart capabilities at <http://www.upf.com/orders.html>

The Curassow's Nest: Myths and Symbols in the Ceramics of Ancient Panama by Mary W. Helms (Gainesville: University Press of Florida, xii + 190 pp., 2000, ISBN 0-8130-1746-7, \$55.00, cloth) focuses on the analysis of ceramics from Sitio Conte in central Panama dating 500-1000 CE that were excavated in 1930. Helms (Anthropology, University of North Carolina at Greensboro) discerns designs and themes that have parallels in Mexican and Maya art and iconography and Amazonian belief systems. This volume is a companion to her *Creations of the Rainbow Serpent: Polychrome Ceramic Designs from Ancient Panama* (Albuquerque: University of New Mexico Press, 1995, viii + 136 pp.) and relates to her earlier *Cuna Molas and Cocle Art Forms: Reflections on Panamanian Design Styles and Symbols* (Philadelphia: Institute for the Study of Human Issues, 1981, vii + 79 pp.).

William Nesse of the University of Northern Colorado has recently published *Introduction to Mineralogy* (Oxford and New York: Oxford University Press, 442 pp., ISBN 0-19-510691-1, \$70.00, cloth). This new volume covers the traditional components: Part 1: crystallography, crystal chemistry, crystal structures, and crystal growth; Part 2: mineral identification (with chapters on physical properties, optical properties, X-ray diffraction, and chemical properties; and Part 3: systematic mineralogy (silicates ff.). The illustrations are especially well done and there are useful extensive discussions of petrogenesis accompanying the introductions to mineral groups as well as the descriptions of individual minerals. Oxford University Press may be contacted at

University Museum Publications at the University of Pennsylvania in Philadelphia has announced the publication of a three volumes and one videotape oriented to ceramics.

Lerna IV: The Architecture, Stratigraphy, and Pottery of Lerna III (two volumes) by Martha Heath Wiencke (332 pp., 108 figures, 39 plans, 19 sections; 494 pp., 103 figures, 24 plates, 3 appendices, 27 tables; ISBN 0987661-304-0, 2000, \$125.00, cloth) emphasizes Lerna II or Early Helladic II materials from Lerna in the Greek Argolid. The second volume contains a complete chronologically arranged catalog organized by shape and fabric. A petrographic analysis of selected sherds is also reported. *Corinth VII, v: Corinthian Conventionalizing Pottery* by Martha K. Risser (200 pp., 64 pls., 30 figures, ISBN 0-87661-075-0, June 2000, \$60.00, cloth) documents workshops producing this fine ware (vases with black and red bands, patterns, and floral motifs) during the sixth through fourth centuries BCE. Contexts, chronologies, painters and workshops, and evidence for systematic export are documented. A publication entitled *LM IA Ceramic Kiln in South-Central Crete: Function and Pottery Production* has been co-authored by Joseph W. Shaw, Aleydis Van de Moortil, Peter M. Day, and Vassilis Kilikoglou (200 pp., 74 figures, 16 tables, 2000, ISBN 0-87661-530-2, \$40.00, paper, *Hesperia Supplement* 30) and presents a detailed analysis of the excavation of a Late Minoan IA cross-draft kiln in Kommos, Crete. This type of kiln was used during the Neopalatial period. The authors document vessel shapes, decorations, and technological characteristics, and present information about the range of firing temperatures, the compositional similarities and differences in the clays being used, and aspects of the firing process. Lastly, a 27-minute VHS video produced by Cinegraphic Films in 1999, narrated by Philip Betancourt (Archaeology, Temple University) entitled "The Potters of Thrapsano: A Modern Workshop with Clues to Ancient Technology" (UM/VHS/04, \$24.95) has been produced. Traditional pottery manufacturing at Thrapsano, Crete included hand- and wheel-made techniques to build up vases in sections. University Museum Publications may be reached at 33rd and Spruce Streets, Philadelphia, PA 19104-6324 (1-800/306-1941, publications@museum.upenn.edu)

Ras Shamra-Ougarit XIII: Ceramiques myceniennes d'Ougarit (Paris and Nicosia: Leventis Foundation, 222 pp., 32 figures, 9 plates, 2000, ISBN 2-86538-267-2, \$46.00, paper) written by Marguerite Yon, Vassos Karageorghis, and Nicholle Hirschfeld with the collaboration of Annie Caubet, is a joint

publication of the Association pour la diffusion de la pensee francaise (Ed. Le Ministere Francaise des Affaires Etrangeres) in Paris and the Leventis Foundation, Nicosia, Cyprus. The text of the volume is in English and French. The authors report 500 new Mycenaean ceramic objects brought to the Louvre that have not been reported previously from excavations in the fourteenth to twelfth century BCE Bronze Age site of Ras Shamra-Ugarit located on the coast of Syria. Karageorghis considers those objects decorated in the Pictorial Style, Yon (site director from 1978-1998) examines the contexts of these objects, and Hirschfeld prepared the ceramic catalog and wrote a chapter on potmarks. Further information may be obtained from the Leventis Foundation by e-mail: leventcy@zenon.logos.cy.net

Available online is *'Ain Ghazal Excavation Reports, Volume 1: Symbols at 'Ain Ghazal*, published under the direction of Gary O. Rollefson and Zeidan Kafafi (Denise Schamandt-Besserat, editor). This Neolithic site located near Amman, Jordan was first settled ca. 7250 BCE during Pre-Pottery Neolithic B (PPNB) and was a village with a mixed farming economy until ca. 6500 BCE when there was a shift to nomadic pastoralism (characterizing PPNC). "Chapter 1: Tokens Finds at Pre-Pottery Neolithic 'Ain Ghazal, Jordan: A Formal and Technological Analysis" by Harry Iceland documents 137 clay and stone tokens (106 clay and 31 lithic, etc.) in the form of cones (n = 22), spheres (n = 93), discs (n = 14), and other (n = 8). Iceland discusses the results of his study of 21 petrographic thin sections (five are illustrated) and 8 XRD analyses, deducing clay characteristics and firing temperatures. "Chapter 2: Animal Figurines" by Schmand-Bessarot and "Chapter 3: Human Figurines" written by Ellen McAdam, are not yet online.

Asian Traditions in Clay: The Hauge Gifts (152 pp., \$29.95) is a new volume by Louise Cort, Massumeh Farhad, and Ann Gunter to be published in late October 2000. The book features examples of ceramics from ancient Iran (33 specimens), stonework from medieval Cambodia (35 pieces), and the earthenware from Islamic Near East (16 examples) that have been donated to the Sackler Gallery by the Hauge family. The Sackler Gallery, a part of the Smithsonian Institution Museums in Washington, DC, has scheduled exhibition for some of these objects scheduled from 29 October 2000 through 22 April 2001.

Alexandra Dimitritrova-Milceva authored *Terra Sigillata und duemmewandige keramik aus Moesia inferior (Nordbulgarien)* (120 pp., 30 plates, 6 illustrations, 8 tables, ISBN 954-90487-3-4, \$21.00 including postage [surface rate]) which became available in June 2000. This study is the first on Roman imported ceramics recovered in the province of Moesia inferior. For further information, please contact Lyudmil Vahalinski at lvagalin@mail.techno-link.cpm

For scholars who read Chinese, *Zhongguo Taoci Quanji (Compendium of Chinese Ceramics)* in 15 volumes (Shanghai: Zhongguo Meishu Denli, Quanji, 2000 ff.) is being prepared, five volumes of which have been published. These include, in English translation: *Compendium of Chinese Ceramics 1: The Neolithic Period* (331pp., 253 color plates, 253b/w illustrations, 2000); 2: *Xia, Shang, Zhou, Spring and Autumn, and the*

Warring States Period (304 pp., 244 color plates, 244 b/w illustrations, 2000); 4: *Three Kingdoms, the Western and Eastern Jin, and Northern and Southern Dynasties* (313 pp., 249 color plates, 249 b/w illustrations, 2000); 5: *The Sui and Tang Dynasties* (291 pp., 229 color plates, 229 b/w illustrations, 2000); and 6: *The Tang Dynasty and Five Dynasties* (277 pp., 223 color plates, 223 b/w illustrations, 2000). The ten volumes yet to be published are: 3: *Qin and Han*, 7: *Song (Part I)*, 8: *Song (Part II)*, 9: *Liao, Xixia and Jin*, 10: *Yuan (Part I)*, 11: *Yuan (Part II)*, 12: *Ming (Part I)*, 13: *Ming (Part II)*, 14: *Qing (Part I)*, and 15 *Qing (Part II)*. The price, by subscription, is about \$1,100 per set. Major Oriental book dealers can provide information, including Hanshan Tang Books (3 Ashburton Center, 276 Cortis Road, London SW15 3AY, UK, <http://www.hanshan.com/hsttopbar.html>) or Paragon Book Gallery (1507 South Michigan Avenue, Chicago, IL 60605, 800/55.BOOKS, <http://paragonbook.com/>)

Roxanna M. Brown's *The Ceramics of South-East Asia: Their Dating and Identification*, 2nd ed. (272 pp., 207 color and 274 b/w illustrations, 69 figures, and 6 maps, ISSN 1-878529-70-6, 2000) previously published by Oxford University Press has recently been reprinted with the author's permission by Art Media Resources (107 South Michigan Avenue, Chicago, IL 60605, 312/663-5351, info@artmediareources.com). The publisher has a website at <http://www.artmediareources.com>. This important volume, a revised and expanded version of the author's Masters' thesis entitled *The Dating and Identification of Southeast Asian Ceramics* (University of Singapore, 1973, directed by William Willetts, last curator of the former Art Museum of the University of Singapore) remains a quarter of a century later the standard reference. When the first edition of the book was published in 1977, it was anticipated that her research would serve to stimulate an interest in documenting Southeast Asian ceramics — and it has served this purpose. The second edition published in 1987 was virtually a new book, with much new and emended narrative and the addition of color plates and monochrome illustrations. It has been out-of-print for a number of years and, therefore, scholars will be pleased to have this reprinted volume available once again. The reprint edition has maintained the color fidelity of the original plates and color illustrations. Following the Introduction, there are six chapters "Vietnamese Ceramics," "The Go-Sanh Kilns," "Khmer Wares," "The Sukhothai and Sawakkhalonk Kilns," "The Northern and Other Thai Kilns," and "Burmese Ceramics." An extensive bibliography and index accompany the volume. Roxanna Brown has lived in Thailand for many years and is a graduate of Columbia University and the University of Singapore, was a special lecturer in South-East Asian art and culture in the Fine Arts Department at Chiangmai University (Thailand), and is presently in the Department of Art History at UCLA.

Rebecca Saunders (Curator of Anthropology, Museum of Natural Science, Louisiana State University), is the author of *Stability and Change in Guale Indian Pottery, 1300-1702* (University of Alabama Press, 2000, 288 pp., ISBN 0-8173-1012-6, \$29.95 paper). In this comprehensive assessment of

changing ceramic attributes beginning with Irene phase pottery, Saunders documents the interaction between Spanish and Native American culture in the Southeastern United States in the 16th century through the end of the Mission period. In this study she used ceramics from coastal sites in Florida and Georgia and employs stylistic and technological analyses in her analysis, and concludes that despite high mortality rates and relocation, the Guale maintained a remarkably stable pottery production with traditional craft elements altered minimally.

Pottery and Chronology at Angel (University of Alabama Press, 2000, 264 pp., ISBN 0-8173-1035-5, \$29.95 paper) is a volume authored by Sherri L. Hilgeman (Anthropology, Indiana Southeast University) that attempts to resolve the internal chronological phasing at the Angel site located near Evansville, Indiana that dates 1200 to 1450 CE. The site was excavated from 1939 to 1989 and produced more than two million artifacts. In this first intensive assessment of Angel pottery, Hilgeman employs attribute analysis and radiocarbon data to divide the Angel assemblage into chronological stages and correlates these with archaeological phases found at other archaeological sites. The analysis is significant for archaeology in the Ohio Valley and the study of Mississippian culture. The University of Alabama Press has a website at <http://www.uapress.ua.edu/> (where 20 percent discounts are offered for Internet orders) or can be reached at 205/348-5180. Orders are handled by the Chicago Distribution Center, University of Alabama Press, 11030 South Langley Street, Chicago, IL 60628, 773/568-1550.

The Society for Historical Archaeology has announced the availability of two new publications that contain some useful information on historic ceramic materials. *Approaches to Material Culture Research for Archaeologists*, 2nd edition, compiled by Davis R. Brauner (440 pp., ISBN 1-886818-05-3, \$25.00 paper) is a reader designed for classroom use. The contents focus on four major topics: Ceramics (6 articles), Glass (7 articles), and Metal, Stone, and Leather (8 articles), and Assemblage and Meaning (4 articles). Included in the first group are "A Vessel Typology for Early Chesapeake Ceramics: The Potomac Typological System" (Beaudry, Long, Miller, Neiman, and Stone); "Changes in Pearlware Dinnerware, 1780-1830" (Sussman); "British Military Tableware" (Sussman); "Response to Market: Dating English Underglaze Transfer-Printed Wares" (Samford); "A Revised Set of CC Index Values for Classification and Economic Scaling of English Ceramics from 1787 to 1880" (Miller); and "Status an Ceramics for Planters and Slaves on Three Georgia Coastal Plantations" (Adams and Boling). This second edition has about 60 percent new material and replaces the 1991 first edition.

A second work is entitled *Studies in Material Culture Research*, edited by Karlis Karklins (258 pp., 250 illustrations, ISBN 1-886818-06-01, \$35.00 paper), is a handbook for researchers who deal with materials recovered from historical sites. Individual chapters are devoted to metals identification, metal files and their reuses, composite table cutlery (1700-1930), historic door hardware, a bibliography of electrical artifacts, a guide to dating glass tableware (1800-1940), and 18th century French blue-green bottles from the fortress of Louisbourg, Nova Scotia. Of special interest are two contributions: "Objects

versus Sherds: A Statistical Evaluation” by Lynne Sussman (pp. 96-103), and “Smoking Pipes for the Archaeologist” by Charles S. Bradley (pp. 104-133). The Society for Historical Archaeology (P.O. Box 30446, Tucson, AZ 85751) accepts credit cards (V, M, AE) and adds shipping charges of \$2.50 for the first book and \$0.50 for a second. Ordering information is also available at the SHA website <http://shaonline.org/pubs2.htm>

You’ve heard of Boston’s “Big Dig” — well this is Sue Scott’s “big fig” monograph. *The Corpus of Terracotta Figurines from the Excavations of Sigvald Linne at Teotihuacan, Mexico (1932 & 1935) and Comparative Material*. Sue Scott. Stockholm: No. 17, 2000

New Publications: Journals and Articles

Archaeologia Bulgarica is a journal (thrice per annum, ca. 100 pages per issue, \$59.00 per year) that accepts contributions in English, German, and French, and emphasizes Southeastern Europe. The initial issue was published in 1997. Conflated annual Tables of Contents for the first three years, and subscription and other information are available on the website <http://www.techno-link.com.clients/lvagalin/> The articles include “A Pontic Pottery Group of the Hellenistic Age (A Survey Based on Examples from the Bulgarian Black Sea Coast)” by A. Bozkova (1:2, 1997), “Spaerantike Glasierte Kermaik aus Bulgarien” by G. Kuzmanov (2:1, 1998), and “Medieval Ceramics with a Micaceous Coating from Plovdiv (11th-12th c AD)” by M. Manolova (3:2, 1999).

JungsteinSITE: Journal of the Neolithic Period in Central Europe is a new online journal, primarily in German (but with English summaries) that began in November 1999. Of particular interest is an article by Thomas Saile (7 February 2000) entitled “Bohemica aus der Sammlung des Gottinger Seminars für Ur- und Frühgeschichte - zu einer ältestkeramischen Siedlung in Nordbohemien” (“Finds from Bohemia in the Collection of the Seminar für Ur- und Frühgeschichte, University of Gottingen - a Settlement of the Earliest Linear Pottery in North Bohemia”). The site’s Table of Contents and information about e-mail newsletter subscriptions are found at: <http://www.jungsteinsite.de/toc.htm>

The initial contribution in the new publication, the *Journal of Caribbean Archaeology*, “Reconstructing Household Vessel Assemblages and Site Duration at an Early Ostionoid Site from South-Central Puerto Rico,” authored by Christopher T. Espenshade (Skelly and Loy, Inc.), is available at the URL <http://www.flmnh.ufl.edu/jca/> In this article 48 ceramic vessels from an Early Ostionoid site (ca. 650 CE), from site PO-21, a hamlet (110 x 65 m) located on the Cerrillos River near Ponce, Puerto Rico, were subjected to technological and formal analyses. Nine vessel classes were developed and Espenshade suggests that PO-21 was the location of from one to three contemporaneous structures, each occupied for less than 20 years.

Judit Molera (University of Barcelona) has placed her five-page article “Mineralogical Evolution and Interaction of the Ca-Rich Pastes with Pb Glazes: Archaeometric Implications — Manufacture Techniques of Islamic and Mudejar Ceramics” on the Internet at <http://www.ub.es/rpat/juditang.htm>

Oriental Ceramic News

The latest *ACRO Update* September 2000 (2/3), the quarterly newsletter of the Asian Ceramic Research Organization edited by Chuimei Ho (Field Museum of Natural History), contains a number of articles relating to a Chinese 13th century Guan Ware ceramic kiln, 17th-18th century glass and ceramics, and a Chinese Potters Newsletter; Japanese ceramics; 14th century Southeast Asian wares from Malaysia and a 15th century Brunei shipwreck; 10th-12th century Indonesian pottery from Sumatra and a 19th century South China Sea shipwreck; a 15th century Vietnamese shipwreck near Hue; letters to the editor; Ceramics on the Internet (the Hoi An cargo auction); and a tabulation of forthcoming Conferences and Exhibitions. There are an unusual number of shipwreck finds reported; most of which are being “excavated” by salvors. Readers wishing to subscribe to *ACRO Update* can write to ACRO, P.O. Box 14419, Chicago, Illinois 60614-0419. Subscription rates for one, three, or five years are \$25.00, \$42.00, and \$95.00, respectively (\$3.00 per year additional for overseas subscriptions); checks drawn on U.S. banks should be made out to ACRO.

Maritime Archaeology: Ceramics from Shipwrecks

Since 1994 the Institute of Nautical Archaeology at Texas A&M University, supported by the Supreme Council for Antiquities for Egypt, have been investigating a Ming-era shipwreck located near Sadana Island in the Red Sea. The shipwreck originally thought to date to 1640-1670 actually dates to 1755-1764 CE and contained ten chests of tea each of which held 900 to 1000 export porcelain tea cups. The cargo was destined for Middle Eastern markets and is chronologically mixed, containing Qing Dynasty Chinese ceramics and Chinese imitations of Japanese decorated wares. There is an excellent discussion in *ACRO Update* 2000 (2-3):2-3 (September) and reference to articles by Cheryl Haldane Ward (Florida State University) at <http://adventurecorps.com/sadana/98report>

A 19th century junk wrecked in January 1822 in the South China Sea is documented in *The Legacy of the Tek Sing* by Nigel Pickford (Stuttgart, Germany: Nagel, 176 pp. 100 color images, ISBN 1-837-57-069-3, 75.00 DM). The volume also contains a section on ceramics by David Freedman. Salvage diver Mike Hatcher excavated the *Tek Sing* (*True Star*) beginning in May 1999. The cargo contained more than 350,000 pieces of Chinese porcelain and is regarded as the largest ceramic recovery in the history of salvage. Information about the loss of this large ship (50 meters long, 10 meters at the beam, and weighing about 1,000 tons) and its 1,600 passengers (of whom only 200 were rescued) and cargo (ceramics, coins, cannon, mercury, and other merchandise), is summarized at the website <http://www.teck-sing.de/english/porzellan.htm> The ceramics are to be auctioned by Nagel Auctions in Stuttgart, Germany. The web site also provides excellent images of examples of the porcelain, the salvage operation, and auction catalog and book purchase information.

Turiang: A Fourteenth-Century Shipwreck in Southeast Asian Waters written by ceramic specialist Roxanna Brown and marine salvage operator Sten Sjostrand has recently been

published (Pasadena, CA: Pacific Asia Museum, 2000, 80 pp., ISBN 1-877921-17-3, \$24.95, paper). This collaborative publication documents about 1,200 ceramic pieces from Thailand, Vietnam, and China that represent about 70 percent of the cargo of a wreck lost 1305-1370 CE. Nearly 50% of the specimens came from the Sukhothai kiln center in north central Thailand. The museum is located at 46 North Robles Avenue, Pasadena, CA and the volume may be ordered from the Museum Shop (telephone at 626/449-2742, extension 20), or via the museum's website at <http://pacasiamuseum.org> The Pacific Asia Museum also has available Virginia Dofflemyer's *Southeast Asian Ceramics from the Collection of Margot and Hans Ries* (ISBN 1-87792-1270), 88 pp., 120 illustrations, 26 color illustrations, \$28.00, paper) which describes this collection at Pacific Asia Museum.

A late 15th to early 16th-century Vietnamese cargo vessel that was lost near Chu Lao Cham Island, Vietnam, in the area of Hoi An town, an ancient trading port in Quang Nam Province, central Vietnam was excavated by Saga Horizon Sdn. Bhd, a Malaysian private company, and the Vietnam Salvage Corporation (VISAL), with the permission of the Vietnamese Government during a four-month period in 1999. The site yielded more than 150,000 ceramic vessels including Vietnamese blue and white objects; ten percent of the ceramics will remain in Vietnam. The remainder of the cargo, considered to be the property of Saga Horizon and the state-owned Vietnam Salvage Corporation, has and will be auctioned (11-13 October 2000 and 4 December 2000) by Butterfield's auction house (an eBay Company) in San Francisco, and on eBay Great Collections for ten weeks beginning on 14 October 2000. *Treasures from the Hoi An Hoard* is a two-volume catalog authored by the excavation director Mensun Bound (Triton Fellow of Marine Archaeology, St. Peter's College, University of Oxford) and by Pham Quoc Quan (Director, National Museum of Vietnam History) Dessa Goddard (Director, Butterfield's Asian Art Department), and John Guy (Curator, Victoria and Albert Museum, London) and published in San Francisco by Butterfield's. The authors document the Hoi An shipwreck and the recovery of its ceramics, while John Guy provides a nine-page scholarly assessment of the Vietnamese wares. His working chronology for the wreck is 1430 to 1480. This two-volume fully-illustrated catalog of the ceramics was to be issued in hard copy at \$65.00, but is available online in a searchable database at the website <http://www/hoianhoard.com>

Mensun Bound is authoring two scholarly publications that will be available early in 2001. *A Typology of the Pottery from the Hoi An Cargo* will be a comprehensive two-volume illustrated catalog of the cargo, ship fittings, and personal possessions of those on board. The set will have 750 pages and 8,000 color illustrations, drawings, and tables. The following ceramic categories will be considered: shipware, dishes, bowls, cups, pouring vessels, bottles, gourds, burners, jars, jarlets, boxes, lime pots, and statuettes (figurines). *The Hoi An Wreck: A Deepwater Cargo of 15th Century Painted Pottery from the South China Sea off Central Vietnam* will be a popular volume and will cover blue and white ceramics, the discovery and excavation of the wreck, the characteristics of the ship, finds from persons who were aboard, the cargo, and chronology.

Because these volumes are not yet completed, information about them including prices and publication dates, may be obtained by writing to Oxford MARE (Maritime Archaeological Research and Excavation), 3 Church Road, Horspath, Oxford, OX33 1RU, UK or by sending an e-mail request for information to publications@oxford-mare.org

A website provided by Sten Sjostrand on behalf of Nanhai Marine Archaeology Sdn. Bhd. is titled "Ming-pottery Found on a Number of Shipwrecks in the South China Sea" has a URL of <http://.ming-wrecks.com/> Although the site emphasizes salvage operations and artifacts for collectors and for investment, there is some information on five ships from the Late Yunan and Early Ming period that were sunk in the South China Sea. The names given to the wrecks are project names only since Asian vessels of this era were not named. The mid-fifteenth century Royal Nanhai wreck located near Kuantan, West Malaysia excavated over a four-year period has a cargo of 20,973 pieces of pottery a majority of which was celadon that came from the Sawamkhalok kilns. Four other vessels have not been studied or excavated. The Longquan wreck is a large Chinese vessel probably dating the late fourteenth century that carried more than 100,000 early Ming period ceramics. Located in 63 meters of water, there are serious diving limitations.

Professional Meetings Held

The Mycenaean Pictorial Pottery Round-Table Conference was held at the Swedish Institute in Athens, Greece from 4-6 December 1999; 13 oral papers and 3 posters were presented. The papers included: "Mycenaean Pictorial Pottery from Midea in the Argolid" by K. Demakopoulou, "The Functional Contexts of Mycenaean Pictorial Pottery at Mycenae" by Lisa French, "Mycenaean Pictorial Style at Kynos" by F. Dakoronia, "Late Mycenaean Pictorial Pottery (LH IIIC)" by J. Crouwel, "Evidence for Mycenaean Pictorial Pottery from the Central Mediterranean" by L. Vagnetti, "Production Places of Some Mycenaean Pictorial Vessels — The Contribution of Chemical Pottery Analysis" by H. Mommsen, "Vases Marked for Trade: The Special Case of Pictorial Pottery" by N. Hitschfeld, "Design Analysis of Mycenaean Chariot Kraters" by C. Morris, "Tracing Stylistic Evolution in Mycenaean Pictorial Vase-painting" by E. Rysteldt, "Mycenaean Vase-painters of LH IIIC" by W. Gunther, "The Rise of the Pictorial Style and the Art of Amarna" by S. Hiller, "Women in Mycenaean Pictorial Vase Painting" by L. Steel, and "The Study of the Mycenaean Pictorial Style in Vase Painting: Achievements and Perspective" by V. Karageorghis. Poster papers were given by Kim Shelton on material from Mycenae, by Alison South on specimens from Kalanason-Ayisos Dhimitrios, and by Paul Astrom on materials from Hala Sultan Tekke and Midea.

The Chronology of Base-ring Ware and Bichrome Hand-made and Wheel-made Ware was held in Stockholm, Sweden, 18-19 May 2000. The first day was devoted, in the main, to Ring-base Ware. The papers presented that day included "Early Base Ring Ware from Phaneromeni and Maroni" by Ellen Herscher; "The Cypriot Base-ring I Jug from a Secondary Burial in Saqqara Mastaba 3507" by Robert Merrillees, "On the Appearance of Bichrome and Base Ring Ware in Several

Excavation Areas at Ezbet Helmi, Egypt” by Irmgard Hein, “The Base Ring Pottery from Tell el Ajul” by Cecilia Bergoffen, “Cypriot Ceramics in Egypt during the Rein of Thutmosis III...” by Kathryn Eriksson, and “From Sherds on the Seabed at Maroni-Tsaroukkas to the Chronology of Late Cypriot I.” by Stuart Manning. The second day focused on Bichrome Hand-made and Wheel-made Ware and seven papers were presented: “Bichrome Hand-made Ware and Bichrome Wheel-made Ware from Cyprus” by Paul Astrom, “The Study of Cypriot Bronze Age Bichrome Ware: Past, Present, and Future” by Michal Artzy, “Bichrome Wheel-made Ware at Nitovikla” by Gunnell Huylt, “Bichrome Wheelmade Ware: still a Problem?” by Vassos Karageorghis, “The Technology of Bichrome Wheel-made Ware” by Eleni Aloupi, “Bichrome Ware, Bichrome-Decorated Wares, and Basepring Wares from Tell el-cAjul and Tell Abu al-Kharaz: Synchronism and Problems” by Peter M. Fischer, and “Bichrome Ware in Tell el-Dab’a: A Chronological Perspective” by Manfred Bietak. Information about Cypriot, Palestinian, and Egyptian sources was shared. The program, abstracts (as available) and a brief summary by Paul Astrom are posted on the “Conferences and Lectures” page of the Cyprus American Archaeological Research Institute’s website at <http://www.carri.org>

The venue of the Pecos 2000 Conference, held at Mesa Verde National Park, 17-20 August 2000, was modified because of forest fires in the region. Nonetheless, the conference was held and more than 70 papers were presented of which four were related to ceramics: “The Blanding Redware Project: First Season” by William A. Lucius (Independent Scholar); “Seeking the Red Ware Potters of the Northern San Juan: Petrographic Analysis of Bluff Black-on-Red” by Ted Oppelt (Mesa Verde National Park); “Ceramics from the Tommy Site, Middle San Juan River Valley, New Mexico” by Lori S. Reed, Joel Goff, and Andrea Carpenter (Animas Ceramic Consulting); and “Redwares at 5MT1604: Cataloging America’s Treasures from Mockingbird Mesa, CO” by Janet Weeth. Further information and abstracts are available online at <http://www.swanet.org/2000sched.html>

The Archaeological Ceramic Building Material Group (ACBMG) met at the University of York, England on 30 September 2000. Four papers were presented: “Pre-Conquest Floor Tiles” by Laurence Keen (John Stark and Partners), “The Use of Ceramic Petrology to Study Medieval Floor Tiles” by Alan Vince (Archaeological Consultant), “A New Approach to Dating Bricks from Standing Medieval Buildings in England and Wales” by Nic Holland (University of Durham), and “Tarbock Tilery Merseyside and the 20th Legion” by Vivien Swan (Swan Pottery). Further information is found on the society’s home page at <http://www.tegula.freeserve.co.uk/acbmg/prog2000.html> Phil Mills has posted his brick and tile recording guidelines (six pages) at <http://www.tegula.freeserve.co.uk/acgmg/mills.htm>

The Fall meeting of the Archaeological Society of Connecticut was held at Norwalk Community Technical College, Norwalk, CT on 14 October 2000. Two of the 11 papers were concerned with pottery: “Prehistoric Pottery and the Real World: Do Connecticut Ceramics Reflect Cultural Reality?” by Lucianne Lavin (American Culture Specialists),

and “Colono-Indian or Colono-African Ware? Evidence from Sylvester Manor, Shelter Island, New York” by Katherine Lee Priddy (University of Massachusetts at Boston).

The annual meeting of the Archeological Society of Virginia held in Franklin, VA on 21 October 2000 included 31 papers. Only one related to ceramics: “Opening an Early 17th Century Time Capsule: How Native American Ceramics from Jamestown Island Can Help Identify Powhatan Contact Period Sites” presented by Randy Turner (Virginia Department of Historic Resources).

Recently announced on the clayminerals-l listserv is a conference, “Advances on Micas: Problems, Methods, Applications in Geodynamics,” scheduled for Rome, 2-4 November 2000. Accademia Nazionale dei Lincei, the Italian National Academy, is convening this meeting in the field of Earth Material Science to review key aspects of the present state of the art for work on this very important group of rock-forming minerals. The meeting is organized in the form of a series of invited plenary lectures, plus a limited number of contributed oral presentations. Extended abstracts for contributed works will be made available by 1 September 2000. Invited speakers include: C. Cipriani, “Micas: The Evolution of Knowledge”; G. Ferraris, “Structural Aspects of Micas”; M. Nespolo, “Crystallographic Basis of Polytypism and Twinning in Micas”; M.F. Brigatti, “Crystal Chemistry of the Micas,” A; S.J. Guggenheim, “Crystal Chemistry of the Micas,” B); P.F. Zanazzi, “Behaviour of Micas at High Pressure and High Temperature Conditions,” A); A. Pavese, “Behaviour of Micas at High Pressure and High Temperature Conditions,” B); T. Kogure, “Investigations of Mica Using Advanced Transmission Electron Microscopy”; B. Grob  ty, “Microstructure in Micas and their Petrologic Significance”; A. Beran, “Infrared Spectroscopy of Micas”; A. Mottana, “X-ray Absorption Spectroscopy of the Micas”; M.D. Dyar, “Spectroscopy of Iron in Micas: New Results from M  ssbauer Effect, Optical, and XANES Pre-edge”; J. Roux, “Thermodynamic Properties of the Mica Solid Solutions”; C.V. Guidotti, “Metamorphic K-Na Natural Micas: Selection of Samples for Study in Order to Maximize the Efficiency of Future Research,” A; F.P. Sassi, “Metamorphic K-Na Natural Micas: Selection of Samples for Study in Order to Maximize the Efficiency of Future Research”; and P.   rkai, “Phyllosilicates in Very Low-grade Metamorphism, and their Evolution to Micas.” Additional information and registration forms are available at in <http://www.unimo.it/micas2000/> For further details contact Daniela Volpato, Secretarial Assistant, at Accademia Nazionale dei Lincei, Via della Lungara 10, I-00165 Roma RM (telephone +39-06-6868223, FAX +39-06-6893616, e-mail address: segreteria@accademia.lincei.it).

The Fourteenth Annual Ceramic Ecology Symposium was held at the annual meeting of the American Anthropological Association in San Francisco Hilton on Friday, 17 November 2000. This symposium, co-organized by Charles C. Kolb (National Endowment for the Humanities) and Louana M. Lackey (Maryland Institute, College of Art) was chaired by Kolb. A list of participants and the titles of their papers was included in the *SAS Bulletin* 23(1):14 (Spring 2000) but a contribution by Sandra L. Lopez Varela (Universidad Autonoma

del Estado de Morelos, Mexico) entitled "Material Evidence of Ceramic Production in the Ethnographic Record of a Pottery Community in Cuentepec, Morelos" was added to the program. Sandra's paper was the first of ten papers and she reported an ethnoarchaeological study of a pottery-making community at Cuentepec and evaluated the use of ethnographic data to identify ceramic production activities in the archaeological record. Other presentations were given by James Sheehy, Elin Danien, Judy Voelker, Christophe Descantes, Robert Harding and Colin Shell (the latter an added co-author), Michael Sugarman, Effie Athanassopoulos and Ian Whitbred, Kostalana Michelaki, Linda Ellis, and Louana Lackey. Miriam T. Stark (University of Hawai'i) was the discussant. This year's symposium included participants from Canada, Mexico, the United Kingdom, Greece, and the United States. During the past several years, other colleagues from Israel, the United Kingdom, Spain, Germany, Mexico, and Canada have also participated. If you would like to participate in the Fifteenth Annual Ceramic Ecology Symposium to be held at the AAA meeting in Washington, DC, scheduled 14-18 November 2001, contact Charlie Kolb at ckolb@neh.gov. Future symposia are being organized and will be held at the American Anthropological Association annual meetings in New Orleans (20-24 November 2002), Chicago (19-23 November 2003), and San Francisco (17-21 November 2004).

The annual meeting of the Society for Historical Archaeology was held 10-13 January 2001 in Long Beach, CA. Larry Buhr, a doctoral student in the Department of Anthropology at University of Nevada, Reno (Ansari Business Building, Reno, NV 89557-0006), organized a symposium entitled "Bricks and Brickmaking in Archaeological Contexts." Additional information may be obtained by telephone or e-mail: 775/784-1781 and buhr@scs.unr.edu

The Australasian Archaeometry Conference, which meets every four years, was scheduled to be held 5-9 February 2001 at The Conference Centre, 22 Symond Street, University of Auckland, Auckland, New Zealand. The theme for the symposium is "Issues and Developments in Australasian Chronology: New Directions for the New Millennium." Seven sessions were scheduled, two of which relate to archaeological ceramics. These are Sourcing/Characterization, convened by Marshal Weisler (Anthropology, University of Auckland) and Residue/Usewear, convened by Peter Sheppard (Anthropology, University of Auckland). The conference proceedings will be published as an edited monograph in the *Research in Anthropology and Linguistics* series. Information regarding the sessions may be found on the conference website at <http://www.car.auckland.ac.nz/car/archconf/archaeometry.html>

Upcoming Conferences

Organized as a symposium for the annual meeting of the Society for American Archaeology in New Orleans, 18-22 April 2001, is a session entitled "Mesoamerican Figurines III: Beyond the Boundaries." Co-organized by Charles C. Kolb (National Endowment for the Humanities) and Cynthia L. Otis Charlton (Independent Researcher, Wellman, IA), and chaired by the former, the contributions will consider current directions in figurine studies using investigations from several periods and

areas of Mesoamerica with extensions into the southwestern United States and northern South America. The introduction to the third biennial symposium will summarize the results of Mesoamerican Figurines I and II held at the Society for American Archaeology annual meetings in New Orleans (1996) and Chicago (1999). In these sessions, clay figurine assemblages from the Mesoamerican Formative, Classic, and Preclassic were assessed in terms of the history of research, contemporary ethnoarchaeological and ethnohistoric analyses, and the current status of interpretive research. The papers in Figurines III continue these studies, reflect new analytical concepts such as gender and ritual contexts. These papers include "Valdivia Figurines and the Interpretive Challenges of Gender" by Richard G. Lesure (University of California at Los Angeles); "Gulf Olmec Figurines from La Joya, Veracruz, Mexico" co-authored by Billie Follensbee (Southwest Missouri State University) and Philip J. Arnold III (Loyola University of Chicago); "Figurines from the Formative Village of Tetimpa, Puebla" by Gabriela Urunuela (Universidad de las Americas-Puebla) and Patricia Plunket (Universidad de las Americas-Puebla); "Cosmovision and Way of Life in the Tula Region: A Figurine Perspective" [Epiclassic Coyotlatelco figurines from Chapantongo] authored by Patricia Fournier (Instituto Nacional de Antropologia e Historia, Mexico, DF); "Buy, Sell, or Trade: Figurine Workshops and Beyond" [Late Postclassic Aztec period at Otumba, Mexico and the results of INAA] Cynthia Otis Charlton (Independent Researcher); and "Fingerprints, Sex, and Figurines from Snaketown in Southern Arizona" by Susan L. Stinson (University of Arizona).

Museums and Exhibitions

The Arizona State Museum in Tucson has received a \$400,000 National Park Service Grant as a part of "Save Our American Treasures" in its quest to fund a \$1.1 million climate-controlled vault to help to preserve the nation's largest collection of Southwestern native pottery. The vault would be 73 feet long and 32 feet wide, with a glass wall that would allow museum visitors to view the collection. A "wildly fluctuating humidity" (15 to 80 percent) is causing destructive salt efflorescence in the ceramic collection. In the main storage room which contains 12,000 Anasazi, Mogollon, and Hohokam vessels, a recent survey found that 18.5 percent of the vessels had visible salt damage, including most of the 1,000 Hohokam red-on-buff decorated vessels.

The University of Michigan Museum of Anthropology (UMMA) in Ann Arbor has components from a number of important ceramic (and non-ceramic) collections on their website at <http://www.umma.lsa.umich.edu/Orient/main.html>. Among these are collections housed in the Asian Range: Koelz (Tibetan tankas and Kashmiri textiles), Stevens (Chinese textiles and decorative arts), Robinson (350 ceramic vessels from Malaysia and Thailand), Guthe (7,500 ceramic vessels from 542 sites in the southern Philippine), and Hester (410 Chinese and Philippine ceramic vessels). There are sample images and artifact descriptions for these collections.

The UCLA Fowler Museum of Culture History at the University of California at Los Angeles has mounted an exhibition entitled "Moche Finesline Painting of Ancient Peru"

(16 July 2000 through 18 February 2001) which documents Moche culture that flourished on the North Coast of Peru from 100-800 CE. The museum's exhibition is augmented by a catalog with scholarly essays, *Moche Fineline Painting: Its Evolution and Its Artists* written by Christopher B. Donnan and Donna McClelland (320 pp., 492 color and 55 b/w illustrations, 1 map, bibliography, ISBN 0-930741-79-X, \$39.95, paper). The authors identify 48 individual Moche artists who painted intricate designs with multiple figures (human and supernatural). The Fowler Museum's website provides additional information about the exhibit and the catalog at <http://www.fmch.ucla.edu/>

Bibliographies

Bill Adams from Flinders University in Australia has posted a series of useful "Material Culture Bibliographies and Studies" — clothing, ceramics, glass, metals, military, and zooarchaeological categories (to name a few) — which are collected and maintained at <http://www.ehtl.flinders.edu.au/wha/bibs/index.html> Of special note are a "Brick and Tile Bibliography" by K. Kris Hirst, "A Bibliography of Ceramic Artifacts" created by William H. Adams, and "Historic and Prehistoric Native Smoking Pipe Bibliography" by Michael A. ("Smoke") Pfeiffer.

Websites

Claylab, an English-language resource for clay and clay minerals is a site located in Heidelberg, Germany that includes information about new publications, standards, online works, software, and suppliers of clay products. Claylinks provides URL hotlinks to organizations such as the Clay Mineral Society, and journals (*Clay and Clay Minerals* and *Soil Sciences Online*), as well as conferences and courses. Among the useful links are the Crystallinity Index Standard Homepage (a guide and database for standardizing XRD determined clay mineral crystallinity and crystal size data), and geology courses (such as Paul Schroeder's GEOL 4550, and Laurence Warr and Heiko Hoffman's "Practical Web Course in Clay Mineralogy"). There is also an online course on SEM from Iowa State University that has several levels from neophyte to experience researcher. The links to current and future conferences is impressive (more than 30 listed as of October 2000. The URL is <http://www.rzuser.uni-heidelberg.de/~jr7/claylab/claylab.html>

Also in this realm of materials, equipment, and information resources is the web site <http://ceramicsearch.com> which has 15 homepage categories: Component and Coatings, Consultants, Equipment and Supplies (Retail and Wholesale), Institutions (art centers, museums, and galleries), Manufactured Products (Retail), Materials, Media (books, CD, databases, search engines, etc.), News, Organizations (arts guilds, professional societies), Potters, Safety, Schools and Education (seminars and workshops), Testing and Quality (quality control, ISO), and Tutorials (material theory to glaze recipes).

MineralWeb, a web site for the 3-D display of mineral structures, is maintained by the Department of Earth Sciences at the University of Manchester and may be found at <http://www.mab.ac.uk/Geology/MineralWeb/Admit.html>

A new pottery e-mail group (discussion list), "arch-pot," was founded on 26 June 12000 and is dedicated to British

archaeological pottery of any period (Neolithic, Romano-British, Anglo-Saxon, Medieval, etc.). It has become a very active list. To join, send a message to arch-pot-subscribe@egroups.com or go to the e-groups website at <http://www.egroups.co/invite/arch-pot> Discussions have included ceramic decoration, pottery stamps, kiln sites, publication, advice, ceramic sequences, brick making, and lime cookers.

Association pour les "Journées de la Ceramique is centered at 14 av. de Caramany, 66720 Rasigueres, France, and has a website at <http://www.chez.com/ceramique/> The site, entirely in French, has nine links on the homepage: Presentation des "Journées" et de l'association, Programme 2000, Experimentations archeologiques, concours de modelage, Repas Neolithique, Conyacts, Leins (five hotlinks), Poterie du Carbassou, and Chateau-Musee de Belesta. Of particular interest are Poterie du Carbassou, which has links to ceramic patrimony (Celte, Ethnique, Ibere, Mailjaciennne, Medievale, Neolithique, Traditionnelle, Terre vernissee and Gres decore); Masques; and Recherches (traditional, including Poterie noire du Portugal and Poterie d'Espagne, and archaeological). The ceramic replication studies are especially valuable as is the documentation of the construction of a vaulted kiln. The images are clear and load quickly.

The Maya Vase Database devised by Justin Kerr is an extension of his six-volume Maya Vase Books. The database currently has more than 1,000 copyrighted rollout photographs depicting scenes and texts found on Maya ceramics. The database is located on the FAMSI (Foundation for the Advancement of Mesoamerican Studies Inc.) website at <http://famsi.org/mayavase> There are four major categories of scenes: Palace, Mythological, Warrior, and Animal.

Archaeology on the Net at <http://www.sercv.com/archaeology/books/index.html> has several useful categories: Under General Books, the category "Ceramics" has 2,191 entries, while "Roman Ceramics" under Classical Archaeology has 144 entries.

The searchable Anthropological Index Online (AIO) is accessible at [http://lucy.ukc.ac.uk/cgi-bin/uncgi/Search_AI/searchh\)bib_ai/anthind](http://lucy.ukc.ac.uk/cgi-bin/uncgi/Search_AI/searchh)bib_ai/anthind) and includes 1,150 entries for "pottery" and 189 for "ceramics."

"Google," a major Internet search engine, lists 743,000 entries for ceramics (20,800 for archaeological ceramics), and 684,000 entries for pottery (45,100 for archaeological pottery).

ARCHAEOLOGY 98 Proceedings

Proceedings of the 31st International Symposium on Archaeometry, Budapest, 27 April - 1 May 1998. Edited by Erzsébet Jerem and Katalin T. Biró. BAR: Archaeopress. 2 vols., 800 pp., 126 papers on Biomaterials; Dating; Field Archaeology; Provenance of Metals; Provenance of Pottery; Provenance of Stones; Experimental Archaeology; and General Archaeometry. GBP 84.00 + postage at 10%. Archaeopress, POB 920, Oxford OX2 7YH, England, UK. tel/fax 44 1865 311914; email: bar@archaeopress.demon.co.uk; web: www.archaeopress.demon.co.uk



Book Reviews

Michael D. Glascock, Associate Editor

Beyond the Bloom: Bloom refining and iron artifact production in the Roman World. David Sim, BAR International Series 725, 1998. xix+ 155 pp., 90 figures, glossary. Paperback. Price: not stated. ISBN 0 86054 901 1.

Reviewed by Edward F. Heite, Heite Consulting, Camden, Delaware 19934 USA

Iron manufacture in antiquity required three distinct steps: smelting, bloomsmithing, and blacksmithing. Bloomsmithing is the least understood of these processes. When iron is smelted by the bloomery process, the resulting raw iron mass (the bloom) is riddled with slag. Bloomsmiths ejected the slag and produced a piece of relatively pure metal that a blacksmith could shape into useful objects. This book explores the craft of bloomsmithing, in the context of ancient Roman iron artifacts.

David Sim based his study of bloomsmithing on the principle that “the best way to understand a complex system is to try to reproduce it.” In the course of reproducing the system, Sim collected data on fuel use, time requirements, and furnace design.

Sim begins by briefly summarizing the fundamental role of relatively cheap iron in the Roman world. In spite of its importance, he states, “A very little is known about the way in which iron ore was mined and processed to produce the wrought iron and steel artifacts which are found in the archaeological record.” Even though the stated scope of the study is the entire Roman iron toolmaking process, its lasting contribution will be Sim’s bloomsmithing experiments. The chapter on toolmaking is useful, and the studies of hammerscale will be useful to future researcher, especially archaeologists working in smithies.

Sim carefully tracked the quantities of materials, fuel, and time required for each process in each experiment. These numbers in turn were used to make rough estimates of the energy and material investment represented by iron in the Roman economy.

Most of us probably assume that ancient bloomsmithing was a relatively straightforward extension of the blacksmith’s work, in which the bloom was assaulted with hammers and refined by brute force. Nothing could be farther from the truth, but this assumption was the starting point of Sim’s experiments. As the author demonstrated, merely beating the bloom will cause catastrophic loss of metal.

Experimental archaeologists and historians of technology have attempted on various occasions to reproduce the bloomery ironmaking process. Sometimes they have produced identifiable blooms, but their most extensive product has been a sizable literature on this phase of the ironmaking process. Bloomsmithing, on the other hand, has been largely neglected

by experimenters. Sim summarizes previous bloomery ironmaking experiments, which have concentrated on the initial step of creating the bloom, and largely omitted bloomsmithing.

In his effort to re-create the art of bloomsmithing, Sim collected ancient graphic sources, including illustrations of curious circular tongs that would play a significant role in the study. He also worked on the floor of the Blist Hill Ironworks at Ironbridge Gorge Museum, where modern machinery is used to refine hot blooms by squeezing out the liquid slag. As Sim acknowledged, “This experience of working with bloom iron proved invaluable, for it provided a greater understanding of the material than can be gained from the literature.” The squeezing process used today at Blist Hill is effective, but Sim quickly determined that it is inapplicable to the Roman conditions he sought to reproduce. Today’s blooms are made from scrap or pig, rather than ore, as was the case in Roman times; for purposes of understanding bloomsmithing, this difference was crucial.

Experiments were designed with three objectives: to quantify the time required; to arrive at a design suitable for a bloomsmith’s hearth; and to quantify the amount of charcoal consumed. In the process, along the way, the experimenters recovered forgotten details of the tools and practices.

Initial experiments were predictably a learning process. After trying in vain to clear hardened slag from the first furnace, the experimenters concluded: “It is possible that the slag could be removed while the furnace was still hot.”

In the earliest experiments, about three-quarters of the iron disappeared from the bloom, which clearly would have been unacceptable for a bloomsmith working in a Roman legionary camp. In some cases, no iron survived. Trying to refine the entire bloom at once was time-consuming and therefore required excessive amounts of fuel, with little benefit. After nine experiments, a different approach was tested. Refining whole blooms clearly could not have been economical.

Bloom experiment 10 marked discovery of a new model for bloomsmithing. Sim realized that a heated bloom would naturally break along the concentrations of slag, which was softer than the adjacent metal. At the outset of this experiment, he smashed the bloom. It broke along the lines of slag, leaving lumps of relatively pure iron with slag on the outside, which could be removed easily by hammering. The problem was to control the small pieces of iron while removing the slag. Here pictorial evidence came to the rescue. A Roman tombstone in the Aquileia Museum is decorated with smith’s tools, including a pair of tongs with round jaws, which Sim reproduced.

Each bloom fragment was held for working in the circular jaws, which formed an enclosure in which pieces of iron from the bloom could be hammered on the anvil. It worked.

The first three experimental blooms processed in the tongs suffered only 11% loss; 200 g of iron could be produced in only 7 minutes 14 seconds, for a significant saving of time and fuel. Sim confidently declared that trade secrets of ancient bloomsmiths had been discovered. Each small piece of the bloom was compressed by hammering, and then the pieces were hammer welded together to make billets for blacksmiths. Sim was able to create billets that resembled known archaeological specimens.

The chapter on artifact manufacturing begins from a sound base of modern experience, as the author notes, "... with the exception of some types of hammer, ... all the tools required for the experiments ... were already in my existing kit of blacksmith's tools." It was relatively simple to reproduce the ancient blacksmith's work in the environment of a modern smithy.

Sim's experiments emphasize the importance of preserving craft knowledge that has been passed down. Sim approached the problem with flawed preconceptions he got from modern metalworking technology. When that failed, he was forced to re-invent knowledge that every Roman [and later] bloomsmith knew from the first day of his apprenticeship. Today's blacksmiths, as Sim discovered, suffer a special disadvantage because they "have little or no experience of wrought iron, much less bloom iron." Archaeologists who are not also blacksmiths, he learned, may not be able to appreciate "the many subtleties of iron working."

When he moved on to toolmaking, the author became as nearly as possible a replica Roman blacksmith, imitating the output of a legionary smith, converting wrought iron billets into standard tools, which included a hammer, a stylus, nails, disposable weapons, a pattern-welded sword and chain mail. Except for fastidious note-taking, the researcher reproduced the toolmaker's work as nearly as possible. Each Roman tool was reproduced and each step was documented.

Sim documented the time required, the metal and fuel consumed, and the most likely production sequence of each tool. Such economic data provided by experimental archaeology may need correction to account for the experimenter's lack of craft experience. The first bolt head took 8 minutes 38 seconds, while the second was made in 5 minutes 12 seconds. The author notes, "With practice at this particular item, a production time of under 5 minutes per item is possible."

Each toolmaking process is illustrated with particularly good line drawings, including a diagram of a pole lathe and sketches comparing Roman and modern methods for fixing a haft to a hammer.

Debris, particularly hammer scale, is found on the floor of any ironworking site, modern or ancient. Archaeologically, hammer scale may be the only process residue that survives on the ground. Sim asked if such wastes in the archaeological record could be used to distinguish the ironworking activities that occurred on a site. Toward this end, he examined scale from his own bloomsmithing and toolmaking sites, an archaeological site, and five modern working blacksmith forges.

Shape, size, and chemical composition were considered in distinguishing the scale samples. All hammer scale, the author concluded, can be described as flakes, spheres, black slag and white lumps. Using XRF analysis, Sim identified chemical differences between residues from bloomsmithing, toolmaking, and welding. Bloomsmithing hammer scale is richer in silicon than the scale from toolmaking, and the scale around a welding forge contained the least silicon, presumably because the purest iron was processed there.

Hammer welding, which requires very high temperatures, produced the smallest spherical waste, indicating that this class of scale might be a useful indicator of working temperatures in

any forge site. While the mixtures of particles differed among the processes, the evidence was insufficient to generalize predictions of what might be found in future archaeological sites. This is a line for future research.

Residues from modern blacksmith shops reflected the varieties of materials, other than iron, that might be encountered in the course of today's repair and fabrication business. Such residues include copper, solder, lead, brass, and wood shavings. Similar mixtures might be found archaeologically in a village blacksmith's shop, as opposed to a production shop on a military camp.

The discussion of hammer scale will be most useful to the largest number of archaeologists, because this is the most common residue in a smithy, regardless of the activity that was performed there. Internal geography of a blacksmith shop may be defined by hammer scale.

Generally, according to Sim, scale is found in the form of a circle, centered just forward and to the left of a right-handed blacksmith. Distribution maps of scale quantities will be particularly useful for interpreting blacksmith shops from which all the furnishings have been removed. Without such guidance in the interpretation of scale, the only reported floor plan details frequently have been locations of the anvil base and the fire. Knowing how to find the blacksmith's working stance, we can now recreate the activity areas within a site.

A glossary at the end will be useful for non-blacksmiths.

Overall, this book represents an excellent apology for the usefulness of experimental archaeology, if that ever was in doubt. The study fills a gap in the archaeology of ironmaking technology, but its lasting contribution will undoubtedly be its prospective role as a guide for archaeologists seeking to interpret ironworking sites.

Seriation, Stratigraphy and Index Fossils: The Backbone of Archaeological Dating. Michael J. O'Brien & R. Lee Lyman, Kluwer Academic / Plenum Publishers: New York, 1999. xi+253pp., 67 figures, 5 tables, index. Price \$59.95, \$40.00 (hardbound). ISBN 0-306-46152-8.

Reviewed by Andrew R. Millard, Department of Archaeology, University of Durham, South Road, Durham, DH1 3LE, UK.

I offered to review this book because I hoped it would be a useful textbook for our master's course in Applied Chronometry as well as for undergraduate teaching. I also hoped to learn something of the state-of-the-art in seriation. My first hope was fulfilled, but not as expected; the second was disappointed.

This book is not an account or textbook of recent research in seriation and stratigraphy. Rather it is an account of the fundamental principles of relative dating illustrated mostly by their development within Americanist archaeology in the period 1910-1950. However it is not merely an historical account, but tries to set out rigorously the principles involved within the context of an explicitly evolutionary approach to archaeology.

Chapter 1 introduces the basic topic of how time is measured and how different methods yield different measures of time as ordinal (relative), interval (absolute) or cyclical. A very emphatic argument is made that we should recognise what type of measure we are using and not confuse them. The chapter ends with a brief introduction to how *we create* units to measure time, which leads on to the next chapter.

Chapter 2 considers a fundamental component of seriation: the type. We all think we know what a type is, but this treatment is both clear and thought provoking. It also offers a very clear reminder, based on the work of James A. Ford in the 1930s that “artifact types are nothing more than tools created and used to order archaeological materials”. This is a very important point: types are created, ideational units, and we should not treat them as if they were empirical, directly observable units.

Having thus laid the foundations of the nature of time and of typology, the book moves on in the next four chapters to consider methods of seriation, stratigraphy, and cross-dating. Chapter 3 introduces the fundamental concepts of seriation. O’Brien and Lyman argue that all seriation is dependent on two sorts of continuity being present in the set of types under consideration: historical continuity and heritable continuity. Historical continuity is the similarity of objects due to chronological closeness and is presumed to reflect heritable continuity, which is similarity due to “common descent”. Many parallels are drawn with biological evolution, particularly the need to be aware of homologous and analogous traits. The authors also refer to the “debate over whether similar archaeological phenomena owe their similarity to common heritage or adaptive convergence”. Although in Darwinian evolution analogous traits arise by adaptive convergence, it is not clear to me that convergence of traits in archaeological types is necessarily adaptive, as decorative features may converge for cultural rather than adaptive reasons. Inheritance amongst types also differs from biological inheritance, as a type may inherit traits from more than one preceding type, but a species cannot inherit traits from more than one preceding species. These important caveats are overlooked, presumably because of the authors’ strong precommitment to a Darwinian evolutionary paradigm for archaeology. The final part of Chapter 3 introduces phyletic seriation where artifacts are ordered by changes in attributes. One example given is the developmental continuum from Clovis points into Dalton points, which can be obscured by the assignment of all points to one or other of these *ideational* units.

Chapter 4 discusses frequency and occurrence seriation. Frequency seriation is the form that is familiar to most archaeology students, where a successful seriation may be represented by a “battleship” curve. Less common, but at times useful, is occurrence seriation where only the presence or absence of types is used to seriate. Three basic requirements are identified: (i) assemblages of similar duration, the shorter the better, (ii) assemblages from the same local area, and (iii) assemblages all from one cultural tradition. There is an excellent discussion of frequency seriation, its assumptions and limitations, but, because of the authors’ self imposed historical limits to their discussion, computer-based statistical methods for seriation are not discussed. This is one of the major omissions

of the book, as such techniques dominate current application of seriation, and can help to deal with one of the limits of manual seriation, namely that “chronologically useful types cannot ‘reappear’ at a later date” (p. 29) (see, for example, Buck & Sahu 2000). The chapter ends with a discussion of the temporal resolution of seriation methods, where the authors note that “types that produce good seriations are likely to have a relatively neutral adaptive value”, which again confirms my suspicion that a selectionist view is not useful in seriation and that some of the discussion in Chapter 2 is irrelevant.

“Superposition and stratigraphy: measuring time discontinuously” is the title of Chapter 5. Of this 44-page chapter, 31 pages are devoted to an historical account of the development of stratigraphic excavation, which while relevant, and showing up some general misconceptions, seems to be overlong. In their discussion of this topic the authors reiterate a point which all archaeologists must remember: you cannot necessarily equate the time of deposition (which *is* related to stratigraphy) to the time of creation of the artifacts found in the deposit. That this needs to be drilled into all of us archaeologists is demonstrated on p. 146, where the authors do just this, albeit with a geological example. In the example, a river deposits material eroded from 80Ma old limestone, which is covered by local organic debris over a century and in turn the river covers this with material eroded from 235Ma old limestone. If we excavated at this point “we would have three strata in chronological order relative to when they were deposited but the ages of the sediments themselves, from bottom to top would be 80 million years old, roughly 50 years old and 235 million years old.” No! The sediments *qua* sediments have ages equal to their ages of deposition. Even the particles in the first and third sediments cannot be said to have the ages quoted, as one cannot necessarily equate the time of deposition of sedimentary limestones to the time of creation of the particles in them. A much clearer discussion of this sort of geological process with a terminology which might be adapted to archaeological situations is given by Pell *et al.* (1997). More importantly the authors assume throughout that “artifacts usually occur within non-cultural, or natural sediments” (p. 147). This may be true in North American prehistory, but try telling that to a European medievalist or the excavator of a tell! Archaeological stratigraphy frequently is *not* equivalent to geological stratigraphy, as Harris (1989) has shown, and this chapter is much the poorer for ignoring this fact. The chapter concludes with a reminder that stratigraphic excavation gives a discontinuous measure of time with breaks at stratigraphic boundaries.

Cross-dating and index fossils are the subject of another lengthy historical treatment in Chapter 6. Again comparison is made with biostratigraphy, which uses very similar techniques. O’Brien and Lyman also manage to fall into another of their own traps. The trap was set back in Chapter 2 where we are told that species are “collections of individuals that look similar and share the same isolating mechanisms” (p. 52), implying that a species is an ideational construct just like an archaeological type. Further we should not conflate an individual artefact (or animal) with its type (or species) as that is conflation of empirical and ideational units (p. 51). The trapper is trapped

on p.204 where “biological species do often interbreed”. Individuals from two species may interbreed, but ideational units do not breed!

Chapter 7 is a summary of the book with some wider philosophical discussion, as the title indicates: “Final thoughts on archaeological time: a clash of two metaphysics”. This discussion looks at science *versus* common sense in archaeology, and partly addresses the perennial question of if and when archaeology is a science. This is followed by the résumé of the book with a series of rather opaque references to the essentialist-materialist paradox in archaeology (no attempt is made to define either term). I suspect one needs to have read O’Brien’s (1996) edited volume *Evolutionary Archaeology* to fully comprehend them.

Overall this is a useful book. Its strengths lie in its clear discussion of time and typology, its explicit consideration of the assumptions of relative dating techniques, and its emphasis on precise use of language. Its weaknesses lie in its strongly Americanist bias, which will put off some readers from elsewhere in the world, and its historical perspective which limits its consideration of methodology. Omissions of major significance are the lack of an account of the use of correspondence analysis for seriation, and the absence of any reference to a quarter of a century’s work on specifically archaeological stratigraphy since the seminal work of Harris (1975). With these caveats I shall be recommending it to my students, because there is little else on the subject, and nothing else as good.

This book has shown me that we need another book on this subject, one with the same rigorous approach, but which includes more recent developments. In the meantime, the final paragraph sums up why you should read this one:

“One could adopt the attitude that none of this matters since radiometric dating has alleviated our chronological problems but knowledge of how methods of relative dating work is crucial to successful archaeological research absolute radiometric methods are no panacea; one needs to evaluate and test the results obtained and relative dating methods provide one source of test implications the only way to [do] archaeology is to retain and to understand and *supplement* with radiometric dating techniques the relative dating methods we have discussed here” (p. 226, original emphasis).

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The Maritime Heritage of the Cayman Islands. Roger C. Smith, University Press of Florida: Gainesville, 2000. xxii +230 pp., 82 figures, 9 maps, 3 appendices, index. Price: \$49.95 (cloth). ISBN: 0-8130-1733-4

Reviewed by William E. Boyd, School of Resource Science & Management, Southern Cross University, New South Wales 2480, Australia

This book is an elegant account of exploration and discovery. It is an account which opens with a description of the joys of fieldwork – surely one of the vitalizing aspects of archaeological and geoarchaeological research – and an introduction to the Cayman Islands Project which has run since the late 1970s. The Project represents the author’s research under the auspices of the Institute of Nautical Archaeology at Texas A&M University, and focuses on the site recording of archaeological sites on the three islands of Little Cayman, Cayman Brac and Grand Cayman, The book is a synthesis of that work. The story of the history and archaeology uncovered by the Project illustrates the process of academic research, and the reminds us of the intimate links between work in the field, the laboratory and the library. It is also, first and foremost, an account of historic exploration and discovery, of a place at once at the centre of things and yet isolated from the mainstream. This is a place discovered by Christopher Columbus in 1503 and subsequently inhabited by pirates, fishermen and seaman, a place of a great abundance of sea turtles and the crocodiles which gave their name to the islands, and a place of great riches and equally great disasters. While the author does not claim to present a complete picture of the history of the Cayman Islands, he does explore key elements of the maritime history and culture of these islands, reviewing the emergence of the distinctive Caymanian culture.

The book comprises six chapters, appended with three transcripts of significant historical documents. The chapters chart the paths of exploration and discovery woven through the book, opening with an introduction to the Cayman Islands Project itself (the Preface and Chapter 1). Chapter 2, “Founded Upon the Seas”, provides a traditional regional and descriptive geography of the Islands. This geography places the islands and the project in context, and is replete with discussions of the cartographic history of the islands, past and present land-and sea-use, the naming of the islands and of the place names of the islands, and, of course, the hurricanes which in many ways have played a major role in shaping the culture of the islands (of which more below). Chapter 3 cuts to the first of three central themes in the history of the Cayman Islands. Under the title “Shoal of Sea Turtles”, this chapter describes the abundance of this natural resource, charting the growth and demise of a rich environmental resource extraction industry. We are told, at the close of this chapter, that “today, many Europeans and most Americans have never tasted the unique flavor of sea turtle ... [and] ... Caymanians no longer set sail on turtling voyages”. This is very much the tale of an industry and associated culture now almost at extinction, along with the very resource, so abundant in the past, that formed the

foundation of both industry and culture. Chapter 4 brings us to the second distinctive aspect of the Caymanian history and culture: "Crocodiles and Pirates" draws together the historical evidence for both the interaction between the early explorers and settlers and these "monstrous Crocodiles", the buccaneers, pirates and corsairs who fled to these islands, and the archaeology which brings them all to life in the present. The final strand of Caymanian culture is then described in the following chapter, "Catboats and Schooners", where the more peaceful maritime culture of the Caymanians is described, focusing on the boating and sailing traditions developed to meet the various needs of an island-bound society. From local fishing along the shores and reefs to long-distance journeying, the Caymanians developed technology and skills as a basis of a maritime culture and legacy that would hold them in good stead for over three centuries. All, of course, was not perfect in paradise, and Chapter 6, "A Graveyard of Ships", reminds us of the perils of a maritime existence. From the earliest days, ships and boats have floundered on the reefs, creating one of the richest maritime archaeological resources available. This chapter describes the evidence available to archaeologists (and, unfortunately, looters and salvors) from the wrecks of the early castaways and pirates through to shipping losses at the end of the twentieth century. The short conclusion draws all these strands together, focussing on the now-pressing need for management, conservation and preservation of the rich and unique cultural heritage resources of the Cayman Islands. Protective legislation is now in place, government is taking note and developing policy, the national local museums are commencing the major task of leading a determined management role, and an international network of interested bodies may be able to support these local efforts. The appendices contain the deposition of Samuel Hutchinson, an eyewitness account of the 1669 Spanish corsair raid on Little Cayman, Lieutenant Alfred Carpenter's 1880 observations on Little Cayman, details from the first census of Cayman, taken in 1802. Finally, this book is supported by extensive notes and a full bibliography including manuscript, printed and oral sources. The book is well indexed, cleanly produced and abundantly illustrated with black and white line drawings and photographs. The author has made expedient use of historic maps, line etchings and photographs.

This book illustrates what archaeology and archaeological sciences do best: it integrates many strands of enquiry, building bit by bit the layers a history which may explain much of the present geography and culture of the islands and their place in the region. The work draws on detailed manuscript research, personal interviews, physical recording of submerged sites, and intricate restoration of artifacts shrouded in centuries of marine organisms and sediments. In doing so, Roger Smith provides an account of human endeavor and the creation and emergence of a distinctive island culture based initially on secrecy but more important then on access to one of the world's richest marine resources. Smith is also making a case for active and directed heritage management. The opening paragraphs of this book recount the events of August 6th 1980, when the Project nearly became unstuck during what turned out to be one of the Caribbean's most severe hurricanes. Surviving the worst that

nature can throw at a tiny island in a wild sea, the project team emerged to survey the damage inflicted on the rich cultural heritage of the seas around the islands. The description of the significant loss of the recorded submarine heritage provide a salient warning about both the fragility of cultural heritage artifacts, and the pressing need for continuing recording of those remains of the past which inform and fill out our histories.

While Smith's intention appears to be to record the heritage of a history and culture which is clearly in decline, if not on the verge of extinction, before it is lost and forgotten, the book seems to me to serve several other functions. First, this book is a carefully crafted and balanced case study of coastal archaeological research, a case study many undergraduate students will delight in reading. Throughout the book, reference is made to the people involved in this research, the academic staff, students and local informants and residents, serving a useful and timely reminder that such work is centrally about people and their cultures. The book is also a fine illustration of the ways in which the disparate strands of historical and archaeological research can be woven together. The ample illustrations reflect this: reproductions of historic documents and maps are presented side by side with historic photographs of the turtle fishing in progress and photographs of the team undertaking submarine surveys of wrecks, conservation work in the laboratory, or interviewing informants in their own homes. Finally, the book also presents a salient warning about natural resource depletion and cultural loss, and as such would serve as a perfect case study text in any environmental management or cultural studies course. And of course, the book is also jolly good read. Good writing is the magical process of transporting the reader to another place and time: how better to do it than with the pirates (Blackbeard and the outlaws Edward Low and George Lowther strut proudly through these pages and corsairs raid our imagination), the "monstrous crocodiles" and unimaginably great shoals of sea turtles, independent and self-sufficient sailors, and graveyards of shipwrecks? This is the stuff of *Treasure Island*!

Indians of the Greater Southeast: Historical Archaeology and Ethnohistory. Bonnie G. McEwan, University Press of Florida, 2000. xvi+392 pp, 26 maps, 9 tables, index. Price: \$55 (cloth). ISBN: 0-8130-1778-5.

Reviewed by Thomas Foster, Department of Anthropology, Pennsylvania State University, University Park, PA 16802

I would like to begin by commending Bonnie McEwan for organizing this volume and the authors for contributing to it. This is a much-welcomed summary of the southeastern Indians. Many of these cultures have witnessed a great deal of research recently and this volume is, to my knowledge, the only work that summarizes it. The historic period in the southeast has great potential for research. The combinations of archaeological and ethnohistoric data have allowed us to trace the population history of specific towns in some cases in detail that was impossible previously. These chapters briefly summarize this and other research in the southeast.

Research on the Timucua has been active. Jerald Milanich's chapter summarizes their social, linguistic, and demographic history based on this research. In contrast to some linguistic evidence the recent archaeological work demonstrates that the Timucua originated in the southeastern United States. Their early history is documented through Spanish mission interaction and recent archaeological research. This work shows fantastic population reduction that has been documented elsewhere in the southeast. The Spanish mission system in Florida was very successful at converting the Indians. Timucua culture was drastically altered socially, ecologically, materially, and politically.

The chapter by Rebecca Saunders overviews the Guale ethnohistory using recent and newly translated documents. Archaeological and osteological research shows that the Guale are descended from Indians living on the Georgia coast for hundreds of years. The ancestral Guale were organized into "complex chiefdoms" where power was inherited matrilineally to males. Males inherited status from their mother's brother. These chiefs only held coercive power. Real power was held by a council of elders. Saunders reviews the archaeological precedents to the Guale including the residential structures, subsistence, health, and cosmology. After years of resistance, the Guale accepted Spanish missionization. This resulted in the concentration of settlements. Resistance, slave raids, and population loss due to foreign disease eroded the Spanish mission influence among the Guale though. Saunders provides a good overview of these processes on late Guale politics, settlements, labor organization, and village life of this group of coastal Georgia Indians that were probably extinct by the end of the 16th century.

The Apalachee have received much research although most of it is ethnohistorical. Bonnie McEwan reviews the few archaeological sites that have been investigated. During the late prehistoric period, the Apalachee were organized as chiefdoms around mounds and outlying settlements. The protohistoric period witnessed Spanish exploration, consequently we know more, though not much, about the social organization of this period. In the early 15th century missionization began. Nine of eleven missions have been tested. One, San Luis, has received more investigation and McEwan concentrates the rest of the chapter on this site.

San Luis was occupied by both Apalachee and Spanish. This and other demographic variables of San Luis indicate that it may not be a good model for the majority of the Apalachee missions. McEwan concludes by describing the presumably contemporaneous native regions of the site: the Franciscan church, the Apalachee council house, and a chief's residence.

The Chickasaw are one of the better studied of the southeastern Indians. Jay Johnson's chapter summarizes this research. These Indians have been documented by Spanish, English, and French sources, which accounts for why we know so much about them. In addition, Johnson reviews the intensive archaeological work in this region, both the older work and the very recent. Much of the archaeological research has focused on ceramics. Consequently, it is possible to distinguish between Chckasaw, Choctow, and Natchez material culture. An interesting feature of the late Chckasaw culture change is the apparent population dispersion from centralized villages of

prehistoric times. This may have been occurring elsewhere in the southeast, namely among the Creek (Waselkov and Smith, Chapter 9), in response to the increase in cattle husbandry.

The Caddo are less documented than other groups in this book. The Spanish and French history of this region is mostly centered on the Hasinai and Great Bend communities. Consequently, the Hasinai are frequently used as models for all the Caddo. Archaeological research in the region is lacking but Ann Early reviews what work has been done. Unfortunately, no historically known settlements have been discovered but this area of research promises to be as useful as it has elsewhere in the southeast.

The Natchez were organized into powerful chiefdoms at the time of the first contact by the Spanish in the 16th century. Yet roughly a century later, they were defeated and dispersed by French soldiers. Karl Lornez's chapter addresses this issue and why such an apparently powerful chiefdom that survived could have disintegrated. This chiefdom apparently survived the European diseases that weakened other chiefdoms of the southeast. A significant part of this chapter discusses the Natchez descent system and the nature of the chief Great Sun's political authority. Lastly, archaeological evidence from central and outlying burials indicate that prestige items and presumably status were relatively more evenly distributed than ethnohistoric descriptions would suggest.

The Quapaw were relatively recent immigrants to the Lower Mississippi valley. Although there is linguistic and historical evidence of this migration, interestingly, the material culture is difficult to distinguish from the indigenous populations. This phenomenon can be seen elsewhere in the southeast. For example, some of the Lower Creek spoke radically different languages yet it is difficult to distinguish them archaeologically. The Quapaw were not as politically organized as some of their neighbors. George Sabo argues for a tribal level of organization based on historical references. This chapter is mostly a review of the interaction and culture change that occurred among the Quapaw as a result of European contact. Some of these changes were consolidation of settlements and a switch from horticultural/foraging economy to a frontier exchange economy.

Because of their proximity to European settlement, the Cherokee are one of the best documented and mapped of the southeastern Indians. In addition, archaeological investigation has been occurring at Cherokee sites for over one hundred years and relatively intensively over the last few decades. The proximity of the Cherokee to European settlement also influenced the culture history of this Indian group. Gerald Schroedl reviews the archaeological changes observed and historical events from the era of Spanish exploration up to removal. The Cherokee are a useful group to study for acculturation because of the differential effects of the European society on the material, social, political, cosmological, and subsistence culture of these southeastern Indians.

The next three chapters summarize the Creek Indians and their descendants, the Seminole. The Creeks were a consolidation of linguistically diverse but culturally similar populations. This is an exciting time for Creek research because of the active archaeological research and long history of ethnohistoric work in this region. Greg Waselkov and Marvin

Smith review the four regional divisions of the Upper Creek. This region has had avocational and professional research since the early 20th century that has successfully focused on identifying specific, historically known towns. We are getting to the point of being able to archaeologically trace the individual migratory history of specific towns and the cultural changes that they underwent in response to European interaction. The chapter by Waselkov and Smith reviews the past and recent archaeological investigations of the Upper Creek. John Worth's chapter focuses mostly on the early history of the Lower Creek. He reviews and reinterprets some of the town-site identifications and particularly the recent refinements of changes in material culture. Lastly, Brent Weisman focuses mostly on the archaeological evidence of Seminole identity. He includes a review of the modern history of these Indians in Florida.

Science and Technology in Historic Preservation. Advances in Archaeological and Museum Science 4. Ray A. Williamson and Paul R. Nickens, eds. Kluwer Academic/Plenum Publishers, 2000. xiii +357 pp. \$85.00 (cloth) ISBN 0-306-46212-5.

Reviewed by Joseph H. Labadie, Southwest Texas Junior College, Del Rio, TX, and John Antoine Labadie, University of North Carolina-Pembroke, Pembroke, NC

This publication represents the fourth in a series focused on "Advances in Archeological and Museum Science" under the sponsorship of the Society of Archeological Sciences (SAS). The stated purpose of this series of publications is to "provide summaries of advances in various topics" related to archeology, preservation technology, and museum conservation. The overarching philosophy evident in this interdisciplinary series evidences the SAS contention that "physical science techniques and methods constitute an essential component of contemporary archeological field and laboratory studies." This approach is well supported by the wide variety of well written works provided by the contributors in this text.

This book has its origins in a 1986 study prepared by the Office of Technology Assessment (OTA) for the Congress of the United States "Technologies for Prehistoric and Historic Preservation" (U.S. Congress, 1986). The purpose of the study was to review how Federal agencies were implementing the numerous laws relating to preservation by focusing on the importance of technological advances in heritage preservation and management. The original OTA study was a springboard that led to the establishment of the National Center for Preservation Technology and Training (NCPTT) within the National Park Service. Today, the NCPTT is the leader among Federal agencies for technical issues in historic preservation and conservation. This organization not only develops and facilitates training for federal, state, and local resource preservation specialists, it also acts as a funding source and a clearinghouse for research and applied studies involving the application of a wide variety of technologies to cultural resources management issues.

The book is divided into four primary sections (Part I: Introduction; Part II: Discovery, Documentation, and Analysis; Part III: Restoration and Conservation; Part: IV Management, Maintenance, and Protection) which, except for Part I and Part II, has multiple chapters each of which focus on specific technological applications that address common resource management issues faced regularly by most public/private land managers. The general layout of each chapter is similar: abstract, introduction, description of the technique, special problems, applications or case studies, and conclusions. Each chapter presents a dizzying amount of information. Adequate assimilation of the work of Chapter is no easy task given that each author attempts to summarize years of past research, provide a current bibliography, and present the information in a style that would be of interest to general readers while not putting the specialist to sleep.

Part I (Introduction) provides the reader with a summary of the major trends in technology transfer to historic preservation over the past two decades, and is an essential primer to understanding the evolution of public policy and how we got to where we are today. Although intended to be merely an overview, additional chapters addressing specific trends, such as the lack of digital standards, would have given the reader a better understanding for context of the seminal works presented in later chapters of the book.

Part II (Discovery, Documentation, and Analysis) presents the meat of the technological revolution in cultural resources fieldwork that allow researchers to maximize data collection while minimizing the destructive effects on the irreplaceable resources that are the object of their study. The chapters in Part II provide the reader with an excellent review on such topics as geophysical techniques used to identify/document terrestrial archeological sites, technology transfers from commercial and military sectors to underwater archeological situations, absolute dating techniques for archeological materials, non-destructive techniques for evaluating historic structures, and analytical techniques for determining the origins of historic objects.

Part III (Restoration and Conservation) is a little thin by comparison to other sections of the book. This section fails to cover most of the critical issues (except technologies used for wood preservation and objects recovered from underwater sites) faced by conservators and museum specialists who are responsible for the long-term well-being of the archeological and historical objects that collectively represent who we were, at other times, and in other places. To some, this oversight may represent the historic indifference that field researchers traditionally have taken towards collections management once they have decided to move on to another site. There are still many archeologists out there, with advanced degrees, that never had to take a Museum Sciences or similar course prior to graduation; this section of the book does little to advance the current issues or explain the critical needs related to museum management. Collections Management, in both the public and private sections, have made quantum leaps in recent years in far-ranging areas such as: metal, glass, and textile conservation; paper, film, and digital archives standardization and preservation; exhibit design and accountability, accessibility, and availability

of collections to the general public which have, in many cases, been paying for their management through their tax dollars. The information is out there, it's just not in this book.

Part IV (Management, Maintenance, and Protection) is a must read for all public and private land managers and all archeology students, now matter how advanced. The chapters in this section lift the veil off of the how managers manage the core issues of heritage preservation, from basic philosophies to the appropriate levels of technology necessary to insure that future generations get the opportunity to see and enjoy what we are trying to preserve today. The chapter on the uses of computers applications in cultural resources management highlights some of the better-known (and tax-payer funded) projects throughout the United States and, to some degree, illustrates how different public agencies would rather re-invent the wheel rather than selectively adapt something that could be bought right off the shelf. There is a chapter that does well in explaining the context of legislative mandates, and takes a cost-benefit analysis approach while discussing selected cultural resources management programs.

For the manager of historic sites, perhaps the two most important chapters in this book are to be found in Part IV: Chapter 13 (Technologies Against Looting and Vandalism, by Judith Reed and Joan Schneider) and Chapter 14 (Technologies for In-Place Protection and Long-Term Conservation of Archaeological Sites, by Paul R. Nickens). With the exception of these two chapters, the majority of the rest of the book focuses on technology transfers that provide new avenues that improve site identification, documentation, data management, and to a lesser degree conservation—which are all important.

Chapter 13 provides an excellent discussion on remote, electronic surveillance devices while clearly pointing out the advantages and limitations of various systems. Although in use by resource managers since 1983, only recently have such systems come down in price (and gone up in reliability) to where they are now a viable option for almost any protection situation and can be operated and maintained by a mere novice. They are more reliable than humans, work twenty-four hours a day, and generally cost far less than the one-year salary of a individual assigned to protect a site. In an era of cost benefit analysis, electronic surveillance systems are the wave of the future in site protection.

Destruction of non-structural archeological sites by a myriad natural physical-biological-chemical processes claim more sites on an annual basis than by all types of vandalism combined. In Chapter 14, the author details a number of case studies from around the United States that focus on archeological site protection strategies which have been borrowed from civil engineering. Techniques that have proven track records in maintaining archeological site integrity include revegetation, site reburial, rock stabilization, the placement of riprap and revetments, and the use of geotextile fabric for erosion and sediment control. These studies, and many others, can be obtained through several different agencies, including the National Park Service (Archeological Assistance Program Technical Briefs), the National Clearinghouse for Archeological Site Stabilization (University of Mississippi), and the U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS

(Archeological Sites Protection and Preservation Notebook).

In conclusion, *Science and Technology in Historic Preservation: Advances in Archaeological and Museum Science, Volume 4* is an excellent text for the general reader as well as all serious students of archeology. Additionally, this volume might well be on the suggested reading list for all graduate students in anthropology and archeology as it certainly provides more than adequate summaries of technologies and developments in the various field and disciplines encompassed within the preservation sciences.

The authors and the volume editors have followed their “prescription” to keep readers abreast of continued developments and concerns within this ever-evolving and truly multi-disciplinary approaches to the discovery; recording and measurement; analysis and evaluation; restoration, conservation and maintenance; protection from catastrophic losses; data and information storage and retrieval; and public education and involvement which, taken altogether, are the concerns of historic preservationists everywhere. Well done.

Interpretations of Native North American Life: Material Contributions to Ethnohistory. Edited by Michael S. Nassaney & Eric S. Johnson, University Press of Florida, 2000. xv + 464 pp., 78 b&w illustrations and maps, 9 tables, bibliography, index. Price \$55.00 (cloth) ISBN 0-292-73109-4.

Reviewed by Raymond A Bucko, Department of Sociology and Anthropology, Creighton University, Omaha, NE 68178 USA. email bucko@creighton.edu

Ethnohistory, the conjoining of anthropological theory and historical research, has proved an invaluable tool for deeper insight into the study of non-Western cultures. Multidisciplinary in its approach, ethnohistory calls on anthropological theory, primary source historical data, oral testimony, and material culture remains to piece together information to construct a fuller, and more multi-perspectival portrait of the past.

This volume grew out of a symposium at the 1995 meeting of the American Society for Ethnohistory at Western Michigan University in Kalamazoo. All the articles in this collection with the exception of one by Larissa Thomas are expanded versions of those conference papers. The goal of the symposium was to envision ways to more actively utilize items of material culture, either in the archaeological record or from artifacts in museums and other collections in ethnohistorical investigations. Both the conference itself and this subsequent volume have succeeded handsomely in achieving this goal.

Michael Nassaney, associate professor of anthropology at Western Michigan University, and Eric Johnson, preservation planner with the Massachusetts Historical Commission, provide an astute introduction to the volume, focusing on the central importance of material culture for expanding historical knowledge of Native peoples, and explaining the methodological approaches inherent in ethnohistory. The work focuses on three processes: the creation, maintenance and transformations of ethnic identity in Native communities. This emphasis provides

a corrective to the popular notion of Native cultures as timeless entities existing only in the past as well as the idea that Native cultures were simply acted upon rather than acted to shape their own futures.

What is unique in this work is that the primary data for these conclusions are gleaned from the physical remains of the culture, carefully analyzed and interpreted in each article as essential to the ethnohistorical method. Sanguine in the central role of artifacts in decoding history, the editors state their central thesis: "Artifacts may be less constrained by some of the biases of written works because they are the direct products of Native hands and therefore originate within a Native worldview". (8) The editors are also optimistic concerning the role of archaeology in enhancing the analytical potential of the ethnohistorical project: "As experts in the analysis of the material world, archeologists and their associates in art history and other related disciplines are well poised to unlock the hidden meanings that art, artifacts, and landscapes held to their makers, users, and viewers. Using a holistic and comparative methodology, they juxtapose objects, texts, oral accounts and other source materials from the present and the past to explore structure, action, and outcome" (21).

While the authors in this book stress the centrality of artifacts in interpreting the ethnohistorical record, they are consistently careful and cautious in the interpretation of material culture. They recognize their own cultural and temporal remoteness from the artifacts themselves and the difficulty of accurately interpreting thought through the examination of material production. While this gives a cast of inconclusiveness to the majority of the articles, the explorations of the possibilities of interpretations are honest and forthright concerning what can be definitely said as well as what further evidence might be needed, and how one might go about conducting future research.

The editors divide the book into three parts. Part I: Ethnogenesis: The Creation, Maintenance, and Transformation of Ethnic Identity, investigates how Native cultures, themselves dynamic systems, actively produce material markers for purposes of identity in a world of increasing European incursions. This section consists in 5 articles. Kathleen Cande, archaeologist with the Arkansas Archaeological Survey and history graduate student at the University of Arkansas, explores techniques in expanding historical knowledge of Native – European interactions in eastern Arkansas from 1541-1682. Facing a paucity of data as well as conflicting and obscure textual reports, the author proposes careful typological analysis of ceramics as a means of establishing the historical arrival and establishment of the Quapah. Ritual, as described in various texts, and material culture are key to establishing the origin, identity, continuity and adaptation of cultural groups in this region. James Pendergast, doctor of science (Hons. Causa.) at McGill University, investigates the question of who were the Iroquois encountered by Cartier in 1535 at Stadacona and Hochelaga, focusing on the importance archaeological data to establish their identity as most probably a distinct group in the St. Laurence area and not one of the "Five Nations" Iroquois of what is now New York State. John Staeck, professor of anthropology at the College of DuPage, Illinois, proposes the

use of myth to ascertain Ho-Chunk (Winnebago) social structures to link the physical expressions of these arrangements with the archaeological record to establish the historical origins of this people. Eric Johnson, preservation planner with the Massachusetts Historical Commission, proposes that the stylistic consistence of Shantokware pottery indicates a specific and distinctive identity construction for the 17th Century Mohegan around Fort Shanto and expresses strong community solidarity. The author suggest that while the more eclectic pottery styles of other Algonkian groups suggest a fluidity of political and social structures, there is a distinctive identity among the Mohegan despite their multinational composition. The last article in this section, by Susan Neill, curator of textiles and social history at the Atlanta History Center, proposes the establishment of a stylistic and symbolic typology of ribbon work garments from the Great Lakes Region in order to understand better the dynamics of dress as an identity marker. Key to this article is the use of oral testimony from living Native ribbon workers.

The second section of this work, Change and Continuity in Daily Life, examines the use of archaeology and, in the final piece, art history to further contextualize the lives of North American natives. Retired Marquette University professor of Alice Kehoe interprets the remains of Francois' House, an independent French trading post in Saskatchewan with a particular focus on gender relations recoverable from the archaeological record and the importance of archaeology, especially where written documentation fails or ignores specific groups or classes of peoples. Brooke Arkush, associate professor of anthropology at Weber State University in Ogden Utah, examines cultural continuities and adaptations among the Paiutes of Mono Basin area of eastern California through the analysis of archaeological remains of a domestic site, suggesting that these areas are particularly apt for recovering information on Native acculturation patterns. Sean Dunham, staff archaeologist at the Commonwealth Cultural Resources Group in Jackson, Michigan, solves the mystery of the function of cache pits at a specific site (pits have different uses in different areas) using archaeological analysis, particularly flotation, physical locations from settlements, and historical documentation. He also stresses the importance of gendered use of physical space, a theme found in many of the articles in this collection. In a brief though exceptionally well-written piece, Carol Mason, professor of anthropology at Lawrence University, and Margaret Holman, research associate at the Michigan State University Museum, suggest that since about all the written evidence concerning the origins of maple sugaring among Natives has been analyzed and has proven inconclusive in determining whether or not this was a pre-contact industry, the very elusive key to solving this historical conundrum is in archaeological evidence, despite the unlikelihood of sugar residue surviving over time. Catherine Carlson, professor of Social and Environmental Studies at University College of the Cariboo, Kamloops, British Columbia, proposes an archaeology of resistance, exploring techniques for demonstrating how material artifacts might reflect strategies of cultural conservatism by examining the remains of Fort Kamloops, a post on the Thompson River as well as the indigenous sites

around the fort. Balanced in its views of accommodation and resistance and the limitations of interpretation, Carlson's research stands as an exemplary instance of collaboration between archaeology and indigenous peoples. Shifting to art history and archaeology, Mark Miller, doctoral candidate in art history at the University of Delaware, utilizes artistic representation (images produced by George Catlin, Karl Bodmer and the Mandan Mato-Topa), archaeology, and ethnohistorical data to search out the objective details and recognize the culture bound tropes of Catlin's images of Native peoples.

Part 3, Ritual, Iconography, and Ideology, consists in 4 eclectic articles and suggests a variety of techniques and tactics for ethnohistorical analysis. Larissa Thomas, research archaeologist at TRC Garrow in Atlanta, Georgia, provides an analysis of human iconography from Mississippian archaeological sites based not on time period or geographical region but on gender. Stressing that female iconography and consequently female persons were central to the beliefs, rituals and political structures of Mississippian communities and that indeed gender roles and relations can be reconstructed, at least tentatively, through careful study of such images. Barbara Brotherton, professor of art history at Western Michigan University, examines a corpus of Tlingit masks collected and described by George Emmons from 1882 to 1893 to demonstrate shifts in artistic style and aesthetics based on cultural changes undergone by the Tlingit as well as the talents and inspirations of specific mask carvers. Paul Robinson, Principal State Archaeologist at the Rhode Island Historical Preservation and Heritage Commission, examines the historical interaction of Native Narragansett and the white population of Conanicut Island (Jamestown, Rhode Island). Proposing an archaeology of forgetting, the author chronicles the history of disputes over disturbed Narragansett burial grounds on the island, demonstrating that oral and written histories do not always match and, as importantly, differing communities, Native and white, both continue to make history in the present and to negotiate power relations. The final article, also dealing with the Narragansett, demonstrates how oral tradition in the form of myth, archaeological evidence, and contemporary Narragansett belief and behavior can be combined to interpret the archaeological record, in this instance the secondary burial of a pipe with a specific individual in a Native cemetery. This article also emphasizes the need for cooperation between archaeologists and Native communities.

This collection, though revised and expanded, remains a collection of conference papers with all their concomitant strengths and weaknesses. Their essential unity is theoretical rather than geographical or temporal. The majority of the papers are short, speculative, and open-ended, suggestive of further research and ideas rather than offering guaranteed techniques or definitive conclusions. Few papers offer silver bullet solutions, but each paper offers appropriately enthusiastic suggestions for incorporating physical evidence, largely gathered through archaeological investigation, into an analysis that will ultimately expand our knowledge of the past. The articles are carefully and appropriately illustrated and contextualized through maps, line drawings and black and white photographic reproductions.

Each piece is carefully researched and annotated with expansive bibliographical references for further research and the editors provide a concluding bibliography as well as a useful index. This work would serve admirably as a text for courses in ethnohistory as well as archaeology when it appears in a less costly paper version.

The Archaeometallurgy of the Asian Old World, edited by Vincent C. Pigott. Philadelphia University Museum, 1999. University Museum Monograph 16/MASCA Research Papers in Science and Archaeology 16. 207 pages; ISBN 0-924171-34-0.

Reviewed by David Killick, Department of Anthropology, University of Arizona, Tucson, Arizona, USA

This volume contains seven review articles on the origins and spread of metallurgy in the southern half of the Asian Old World – a region extending from the eastern Mediterranean to China. Six of the seven articles were originally presented in 1988 at a joint American/Soviet symposium in the Soviet Union. The proceedings were never published, though a summary article appeared in Russian in 1989, and is appended in translation to this volume.

Six papers from the conference are presented here, most updated in 1996 or 1998, while a seventh was commissioned for this volume. The sequence of chapters follows geography rather than chronology, moving from west to east. James Muhly leads off with a brief review of the origins of copper and bronze in the Eastern Mediterranean and Cyprus, but neglects to provide a map; readers unfamiliar with the eastern Mediterranean will need to supply their own to follow the argument. The most interesting revelation here is the precocious appearance of tin bronze in the northern Aegean in the third millennium (Early Bronze Age, EB). Muhly makes a strong argument for a trade in tin along the Black Sea, with Troy as the main entrepôt for the tin trade to the Aegean. The ultimate sources of tin for the EB in the Aegean and Near East are still unknown; Muhly favors those of Afghanistan, Central Asia or Pakistan, none of which have seen even basic archaeometallurgical survey.

Jane Waldbaum provides a welcome update to her much-cited corpus of the earliest finds of iron in the Near East (Waldbaum 1980). About 150 pieces of iron have been identified (or misidentified) from contexts dated between ca. 5000 and ca. 1200 BC. About one third of these have been subjected to chemical or metallographic analysis, which reveal the presence of both meteoritic and smelted iron. Some of the latter is certainly a by-product of the smelting of copper, supporting the current consensus in archaeometallurgy that iron smelting developed out of copper smelting technology through the mastery of more reducing atmospheres. Iron remains much rarer than bronze throughout the Early Iron Age (ca. 1200-900 BC). The Hittites, Dorians and Philistines have been claimed to have had special roles in the dissemination of iron working, but Waldbaum dismisses each in turn. Nor is she much impressed by the theory that a shortage of tin, brought about

by the collapse of civilizations after 1200 BC, forced the adoption of iron. She points instead to metallographic evidence for slowly increasing ability after 1200 BC to produce steel and to harden it. As she recognizes, confirmation of this view would require much more metallographic evidence than is yet available.

Tamara Stech discusses early metallurgy in Anatolia and Mesopotamia. The one hundred artifacts of hammered native copper in Neolithic Cayonu (ca. 7250-6750 BC) remain an isolated anomaly, and few metal finds are reported from Anatolia and Mesopotamia until the late fourth millennium, when the first evidence of smelted copper, arsenical copper and even tin bronzes occurs. Tin bronze, though present, was a minor fraction of the analyzed artifacts in third millennium Mesopotamia except in the royal graves at Ur and Kish. Contemporary sites in Anatolia have very variable proportions of bronze. As noted above, tin bronzes are well represented at Troy and in the Aegean at this time. Bronze is rare in western and eastern Anatolia, but occurs at moderate frequency in central Anatolia. These patterns strongly suggest more than one supply route for tin. It is striking that bronzes are more common in central Anatolia in the EBA than in the MBA. Could this reflect use of tin from the EBA mine at Kestel in the Taurus Mountains? Whole forests have been felled, and countless small furry animals left homeless, to manufacture the paper consumed in the debate over Kestel. Muhly, the chief critic of claims for EBA tin mining in the Taurus, reiterates his opposition here (p. 20), but recent evidence (Yener and Vandiver, 1993) has convinced most others that some tin was produced here in the EBA.

The early metallurgy of the Iranian Plateau is incisively reviewed by Vince Pigott. Among the many important insights in his chapter is a caution against the widely-accepted view that present Oman was the dominant source of copper for Mesopotamia in the later fourth millennium. Not so fast, says Pigott. While the superb work of German archaeometallurgists has established both the large scale of Bronze Age copper mining in Oman and the similarity of the unusual trace element suite in both Omani and Mesopotamian copper, Pigott notes that the under-researched Iranian mining district of Anarak has very similar ores. Future scholars will have to consider the relative contribution of these two sources of supply. Equally important is his discussion of the relative rarity of bronze on the Iranian plateau during the Bronze Age (ca. 3200-1350 BC). During this time bronze became the dominant alloy in Mesopotamia, and it is widely assumed that the constituent tin - together with the gold and lapis lazuli that are so prominent in Sumerian and other Mesopotamian sites - came from Afghanistan. If so, most of it bypassed, or passed through the Iranian Plateau, on which arsenical copper remained the dominant copper alloy until the Iron Age.

The chapter by Jonathan Kenoyer and Heather Miller on metals in the Indus Valley sequence was invited to fill a major gap in coverage at the original conference. They make a valiant, if much too wordy, attempt to make sense of the available archaeological and archaeometric data. Unfortunately the latter consist mostly of old wet-chemical analyses of very poor quality. From the low totals obtained most of the metals were wholly or partly corroded, and/or could not be fully dissolved. These

analyses cannot be considered representative of the original compositions. Metallography has barely begun to be applied in this region. These drawbacks make it premature to attempt systematic comparison of the Indus Tradition sequence of copper alloys (5000-1300 BC) with those of Iran and Mesopotamia.

The chronology of the earliest iron in South Asia is reviewed by Gregory Possehl and Praveena Gullapalli. Their chapter is a broad-brush survey of the chronology of the early iron-using cultures, based in large part upon an appended list of 130 radiocarbon dates (presented only as calibrated one-sigma ranges) and four thermoluminescence dates. They conclude that there seems to be "a contemporaneity in the appearance of iron in the various parts of the subcontinent" (p.158) around 1000 cal BC, but I fail to see how this conclusion follows from the data that they present. The radiocarbon dates for each of the regional sequences discussed vary so widely that it is difficult to see any consistent pattern. A more focussed critical examination of key assemblages (like those of Muhly, Waldbaum and Pigott, above) would have been more useful, but Possehl and Gullapalli undertake this only for eight supposed occurrences of iron in Bronze Age contexts. The most intriguing of these are several bimetallic (bronze and iron) artifacts from Mundigak, Afghanistan, said to date between 2600 and 2100 BC, but it is not known whether the iron was meteoritic or smelted. Most of the remaining instances are finds of iron minerals rather than iron metal. The concluding section, on technical studies of ancient iron and ironworking, fails to cite much of the more recent work on the subject by Indian scholars.

The final chapter, by Bennet Bronson, concerns the transition to iron in China during the first millennium BC. This paper (essentially as written in 1988) has suffered from the delay in publication, because in the interim Donald Wagner published his *magnum opus* on the same subject (Wagner 1993). Bronson's chapter can however be highly recommended to those unwilling to tackle the 573 pages of Wagner's book. (It should be noted that the great majority of the studies cited by Wagner and Bronson are in Chinese, and thus previously unknown to most Western scholars).

The question of when iron was first smelted in China remains uncertain, as does the question of diffusion versus independent invention. Bronson and Wagner concur that it was not until the middle of the Warring States period (475-221 BC) that the use of iron became widespread. Analyzed artifacts of this period include cast iron, steel and wrought iron. As is well known, cast iron was a Chinese innovation and was produced on an astonishing scale as early as the Han Dynasty (206 BC - 220 AD), with iron production becoming a state monopoly in 117 BC. Bronson provides an excellent short summary of the techniques of early Chinese ironworkers, which are of a variety and productivity unknown in Europe until the second millennium AD.

In conclusion, most of the chapters in this volume are exemplary, and much-needed, reviews; the authors have done great service to their colleagues. It is odd that there is no review of early metallurgy in South East Asia, given that Pigott himself is the leading authority on this topic, but this is a minor quibble. As reviews are supposed to do, these call attention to areas in

urgent need of further research. The most pressing of these is the question of the tin trade. Clearly the distribution of bronze and tin provides a unique window onto interaction between ancient Near Eastern societies. This has been a key issue in Near Eastern archaeology for the past thirty years, and is regrettable that intense archaeometric efforts to find ways to “fingerprint” tin (none of which are mentioned in this volume) have thus far been unsuccessful. It appears that answers will have to come from filling in the archaeological blanks on the map. Given that critical regions (Afghanistan, Iran) are unlikely to be accessible in the near future, it could be another thirty years before this question is settled.

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Antropologia y Tecnica. Nueva Época. Luis Barba Pingarrón, editor. 2000. ISSN 0186-9787. 94 pp.

This new issue includes 10 articles, all in English, and is devoted to archaeometry. The journal will continue to emphasize interdisciplinary studies of anthropology in Mexico, Latin American countries and Spain, with articles in English or Spanish with abstracts in both languages. Correspondence: Instituto de Investigaciones Antropológicas de la UNAM, Departamento de Publicaciones. Circuito exterior s/n, Cd. Universitaria, 04510, México, D.F. tel 5622 9654/9531; fax 5622 9651; 5665 2959; email: barba @servidor.unam.mx; libreria @servidor.unam.mx.

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Meetings Calendar

Susan Mulholland, Associate Editor

* = new listings; + = new information for previous listings

2001

Feb. 5-9. Australasian Archaeometry Conference. Auckland, New Zealand. Peter Sheppard, Dept. of Anthropology, University of Auckland, Private Bas 92019, Auckland, New Zealand; tel: 64-9-373-7599 x8572; email p.sheppard@auckland.ac.nz; web: car.ant.auckland.ac.nz/archconf/arch_feedback.html.

* March 29-30. Archaeometry in Europe in the Third Millennium. Rome, Palazzina dell’ Auditorio, Via della Lungara, 230. Sponsored by the Accademia Nazionale dei Lincei, Centro Linceo Beniamino Segre, and the Dipartimento di Energetica, Università di Roma “La Sapienza”. All information is available on the Lincei’s website: <http://www.lincei.it>

- * April 8-12. European Union of Geosciences meeting, Strasbourg. Includes sessions on Geomorphology and the Quaternary. Full details of all these sessions and the procedure for abstract submission are given on the EUG website: <http://eost.u-strasbg.fr/EUG/Circulaire2.html>
- April 18-22. 66th Annual Meeting of Society for American Archaeology. New Orleans, Louisiana, USA. SAA headquarters, 900 Second St. NE #12, Washington DC 20002, USA; tel: 202-789-8200; fax: 202-789-0284; email: meetings@saa.org; web: www.saa.org.
- April 25-29. CAA2001. Computer Applications in Archaeology. Visby, Gotland, Sweden. Organizer: Professor Göran Burenhult, Gotland University College, Cramérgatan 3, 621 57 Visby, Sweden; email: caa@hgo.se. All registration information, including call for papers form and mailing list, are available at the CAA homepage: <http://caa.hgo.se/>
- * May 19. Historical Metallurgy Society Ltd. Annual General Meeting and Spring Meeting. London & Scandinavian Metallurgical Co. Limited, Fullerton Road, Rotherham, South Yorks, S60 1 DL. Contact Eddie Birch, 1 Fields End, Oxspring, Sheffield, S36 8WH. tel 01226 370331; fax 01709 830391; email: eddiebirch@compuserve.com
- June 24-28. Earth System Processes: Geological Society of America and Geological Society of London. Edinburgh, Scotland. Ian Dalziel, University of Texas at Austin. Web: www.geosociety.org/meetings/edinburgh/index.htm.
- * Aug. 1-3. The State of the Art in Phytolith and Starch Research in the Australian-Pacific-Asian Regions, Canberra, Australia. Contributions from all areas of phytolith and/or starch research are sought for oral or poster presentations. Web: <http://car.anu.edu.au> (follow the links). Organisers: Lynley Wallis, Dept. of Archaeology and Natural History, Research School of Pacific and Asian Studies, The Australian National University, Canberra ACT 0200 Australia. email: car.conference@anu.edu.au; Doreen Bowdery (ANU); email: Doreen.Bowdery@anu.edu.au; Carol Lentfer (SCU), email: clentf20@scu.edu.au; Jeff Parr (SCU); email: jparr@scu.edu.au
- Aug. 26-30. 10th Archaeological Chemistry Symposium at the American Chemical Society meeting. Chicago, Illinois, USA. Kathryn A. Jakes, 1787 Neil Avenue, Columbus OH, USA 43210; tel: 614-292-5518; email: Jakes.1@osu.edu
- * Aug. 29-Sept. 1. Archaeological Science 2001. University of Newcastle upon Tyne, UK. Web: <http://www.ncl.ac.uk/geography/conference/conference.html>. Email: m.collins@ncl.ac.uk.
- * Sept. 2-8. International Union of Pre- and Protohistoric Sciences, Liege, Belgium.
- Sept. 18-22. PAGES PEPIII Conference. Aix-en-Provence, France. Catherine Stickley, Environmental Change Research Centre, University College London, 26 Bedford Way, London, WC1H 0AP, UK; tel: 44-0-20-7679-5562; fax: 44-0-20-7387-7565; email: c.stickley@ucl.ac.uk; web: www.geog.ucl.ac.uk/ecrc/pep3.
- * Sept. 19-23. 7th Annual Meeting of the European Association of Archaeologists, Esslingen am Neckar, Germany. Forms and information available on the web: www.esslingen.de/eaa2001/e-q-q-d.html Program proposals are due May 1, 2001, with earlier proposals receiving preferential treatment. For further information: EAA-Tagungsbüro 2001, Marktplatz 16, 73728 Esslingen am Neckar, Germany. fax 711-3512.2912; email eea2001@Esslingen.de
- + October 3-6, 2001. 6th European Meeting on Ancient Ceramics (EMAC '01). Ceramic in the Society. Organized by M. Maggetti and V. Serneels, Institute of Mineralogy and Petrography, University of Fribourg, Switzerland. tel 41 26 3008920 / 31; fax 41 26 3009765; email: vincent.serneels@unifr.ch; web: www.unifr.ch/mineral/emac01. Abstracts are due May 1, 2001. Special sessions cover topics including: social interactions and constraints in the fields of production and consumption; history of development of ceramic technology and driving forces for innovation; ceramic materials used in pyrotechnologies (metallurgy, glassmaking, etc.); and scientific methods for the determination of the function of ceramics (residue analysis, etc.).
- late Sept. A Fiftieth Anniversary Symposium on Scientific Research in the Field of Asian Art. Forbes Symposium 2001, DCSR, Freer Gallery of Art/Arthur M. Sackler Gallery, Smithsonian Institution, Washington, DC 20560; email dcsr@asia.si.edu.
- * Nov. 14-17. New Discoveries from Materials Science in the Archaeology of the Near East. Symposium at the Annual Meeting of the American Schools of Oriental Research (ASOR), Boulder, Colorado. Session Chair: Elizabeth S. Friedman, University of Chicago. email abstracts by April 1 to: esf1@midway.uchicago.edu. Forms available at ASOR registration website: <http://www.asor.org>
- * Nov. 26-30. Materials Issues in Art and Archaeology VI. Fall 2001 Meeting of the Materials Research Society, Nov. 26-30th, Boston, MA, USA. Submit abstracts and register at www.mrs.org/meeting/fall2001/ by June 19th, 2001. Organizers: Pamela B. Vandiver, Martha Goodway, Jennifer Mass & James Druzik. For more info: P.B. Vandiver, Smithsonian Center for Materials Research and Education, 4210 Silver Hill Rd., Suitland, MD 20746, USA; email: vandiverp@scmre.si.edu; tel (301) 238-3700 x-162; fax (301) 238-3709.

2002

- * April 22-26. 33rd International Symposium on Archaeometry, Amsterdam. E.A.K. Kars, Rikjsdienst voor het, Oudheidkundig, Bodemonderzoek, PO Box 1600, 3800 BP Amersfoort, the Netherlands. Tel 31 33 422 76 06; fax 31 33 422 77 99; email: e.kars@archis.nl; web: www.archaeometry.vu.nl. Deadline for abstracts is November 1, 2001.
- Aug. 14-21. 17th World Congress of Soil Science, Bangkok Thailand. Arid and Semi-Arid Soils: Records of Past Climates, Carbon Sequestration, Genesis and Management. Convenor: Brenda J. Buck; University of Nevada Las Vegas, Department of Geoscience, 4505 Maryland Parkway, Las Vegas NV 89154; tel 702-895-1694; email buckb@nevada.edu; web: <http://www.17wcss.ku.ac.th/>

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