



SAS Bulletin

Society for Archaeological Sciences

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From the Editors

By combining anthropological questions and theory with materials science methods, archaeological science maintains an inimitable position in the scientific and intellectual world, because it provides information at a scale and resolution that allows us to address problems that transcend the narrow confines of unidisciplinary research. Rapid advancements in technology, engineering, and chemistry over the past decade have enabled archaeological scientists to offer unique and compelling arguments for everything from human origins to the peopling of the Americas. Often, this work informs public policy on heritage management issues, such as in the controversies surrounding the repatriation of “Kennewick Man” or the mitigation of the proposed motorway through the Hill of Tara near Dublin.

Given the increasingly important role of archaeological science and other kinds of applied research, beginning with this issue of the *SAS Bulletin* we are including short articles that summarize research projects combining archaeology and materials science. The greater goal of this effort is to celebrate the various ways in which archaeological science contributes to scientific knowledge as well as to solving modern social problems. We hope that these articles also will provide venues for increased scientific collaboration across the globe. Thus, we encourage you to share your copy of the *Bulletin* with friends and colleagues—especially the ones (usually family members!) that can’t seem to understand what it is you do or why you do it.

The first article, which appears on pages 9 and 10, is by Karla L. Davis-Salazar, an anthropological archaeologist who works with archaeometrists, geoarchaeologists, epigraphers,

and art historians to learn about how early Maya kings used political and religious rituals to engender buildings and create cosmic cityscapes. In her article, Davis-Salazar summarizes the physical and chemical studies of pigments used in royal caches and burials at the city of Copán in Honduras. Combining X-ray diffraction analysis with scanning-electron microscopy, she and her colleagues have found that the Maya used different minerals to represent the same colors of pigments, suggesting that mineral acquisition and use had symbolic meanings as well as technological ones.

With these articles, we hope to honor the work of our colleagues by providing a place, however small, where they have the opportunity to share their investigations and exciting discoveries. We are looking for research that shows how archaeological science is not a discipline with a single set of related paradigms, but rather is a transdisciplinary amalgam that draws on methods and theories from diverse natural, earth, and social sciences. If you would like to share your research with the readership of the *Bulletin*, please contact us right away with your story idea; by the time this issue is in your hands, we will already have begun preparations for the next installment. We look forward to your correspondence.

E. Christian Wells & Robert H. Tykot

In This Issue

Employment Opportunities	2
Award and Fellowships	2
Conference News and Announcements	3
Conservation & Art Materials Encyclopedia On-Line	4
SAS Report on Archaeometry 2004 (R. A. Armitage)	4
Archaeological Sciences Symposium (A.J. Vonarx)	5
SAS Business Meeting Minutes (A.J. Vonarx)	8
Analysis of Maya Pigments (K. L. Davis-Salazar)	9
Archaeological Chemistry (N. Reber)	11
Remote Sensing and GIS (A. Sarris)	11
Archaeological Ceramics (C. C. Kolb)	13
Book Reviews (M. E. Hall)	
<i>Cultivated Landscapes</i> (M. Kim)	24
<i>Tepe Gawra</i> (M. S. Chesson)	25
<i>Study of Bifacial Technologies</i> (S. Milliken)	27
<i>Vashon Island Archaeology</i> (J. Daehnke)	29
Upcoming Conferences (C. P. Stapleton)	30

Employment Opportunities

Boston University's Department of Archaeology announces a tenure-track opening for an Assistant Professor, Expertise in Environmental Archaeology (other than Geoarchaeology) required, with a preference for Palaeoethnobotany; geographical and period specialization open. Ph.D. is required, together with major ongoing research program. Candidates should be prepared to teach general archaeology courses and an introductory course in archaeological sciences in addition to courses in their special field. Application letters should be accompanied by a curriculum vitae, published paper or sample of writing, and the names of three referees, and should be sent by February 1st, 2005 to: Professor Norman Hammond, Boston University, Department of Archaeology, 675 Commonwealth Avenue, Boston, MA 02215-1406.

The **Department of Geosciences at Murray State University** seeks a full-time, tenure track Assistant Professor in Environmental Geoscience to begin August 1, 2005. Ph.D. required by date of appointment. For details visit: <http://www.mursuky.edu/qacd/cos/geo/ad/>

The **Department of Anthropology at Arizona State University** seeks an individual who has demonstrated an ability to develop formal models of archaeological, historical, or modern social dynamics. This position will focus on modeling as a tool to develop scientific insight and social theory, not on modeling reality or decision support. This position will be a joint appointment with the Department of Computer Science and Engineering, but it is expected that this individual's tenure home will be in the School into which the Department of Anthropology is transforming. Salary is commensurate with experience. For complete qualifications and application information see <http://www.asu.edu/clas/anthropology>. Review of applications will begin on January 18, 2005; if not filled, 1st and 15th of each month thereafter until search is closed.

Applications are invited for a **Lectureship in Archaeological Materials at the University College London, Institute of Archaeology**. The appointee will be expected to contribute to some undergraduate courses and postgraduate teaching. The primary teaching will be within the MSc in "Technology and Analysis of Archaeological Materials" and the appointee will have expertise in basic science as well as ceramics, and/or metals, and/or glass. The appointee will be expected to contribute actively to the running and future development of the Wolfson Archaeological Science Laboratories. Applicants should have (or be about to complete) a doctoral degree in archaeology or other relevant subject. The Lecturer will be expected to supervise research students and develop a strong research and publication profile. Applications with a full CV, list of publications and names of three referees should be sent to The Financial Administrator, Institute of Archaeology, 31-34 Gordon Square, London WC1H 0PY e-mail barbara.brown@ucl.ac.uk. Closing date for applications is Monday 22 November 2004.

Awards and Fellowships

The **Society for Archaeological Sciences R. E. Taylor Student Poster Award**. The Society for Archaeological Sciences (www.socarchsci.org) is offering a prize for the best student archaeometric poster presented at the 2005 Meeting of the Society for American Archaeology in Salt Lake City, Utah. The prize is a one-year membership in the SAS, including the quarterly *SAS Bulletin* and the monthly *Journal of Archaeological Science*. The student should be the first author and the presenter of the poster. Criteria for the award are significance of the archaeological problem, appropriateness of the archaeometric methods used, soundness of conclusions, quality of the poster display, and oral presentation of the poster. To apply, send a copy of the poster abstract (indicating the student author), a correspondence address, and the name and date of the session in which the poster will be presented. Submit by March 23, 2005 to: Aaron Shugar, Archaeometallurgy Laboratory, Lehigh University, 5 East Packer Ave., Bethlehem, PA 18015, USA, tel 610-758-4701, fax 610-758-3526, a.shugar@lehigh.edu.

The **Laboratory for Archaeological Chemistry** at the University of Wisconsin-Madison maintains an annual program of research award grants to graduate students in archaeology programs around the world. The lab staff strongly believes that 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. Deadline: 1 January for awards beginning in 1 September of the same year. Award: One award will be made each year consisting of analytical services involving elemental or isotopic measurements available with Laboratory for Archaeological Chemistry instrumentation. Questions and Applications should be addressed to T. Douglas Price or James H. Burton, Laboratory for Archaeological Chemistry, University of Wisconsin-Madison, 1180 Observatory Drive, Madison WI 53706 USA. Phone: 608-262-2575 (tdp), 608-262-0367 (jhb), 608-265-4216 (fax). Email: tdprice@facstaff.wisc.edu or jhburton@facstaff.wisc.edu. For further information on the Laboratory for Archaeological Chemistry, please see our web site at www.wisc.edu/larch/aclab/larch.htm.

The **Society for American Archaeology Fryxell Award for Interdisciplinary Research**. Initiated in 1977 to specially recognize interdisciplinary excellence by a distinguished scientist, who need not be an archaeologist but whose research has contributed significantly to American archaeology. Each year the award is based on practice in one of five disciplines: earth sciences, physical sciences, general interdisciplinary studies, zoological sciences, and botanical sciences. The award, which consists of a citation and a medallion, was named in memory of Roald Fryxell, whose career exemplified so well the crucial role of interdisciplinary cooperation in archaeology. Deadline: February 7, 2005 for all nomination materials for the 2006 award.

Send nomination materials to: Elizabeth J. Reitz, Georgia Museum of Natural History, University of Georgia, Athens, GA 30602-1882, email: ereitz@uga.edu. For more information about the Fryxell Award and previous recipients of the Award, please refer to the SAA web site at www.saa.org/aboutsaa/awards/fryxell.html.

The American Anthropological Association invites minority doctoral candidates in anthropology to apply for a dissertation writing fellowship of \$10,000. The annual **AAA Minority Dissertation Fellowship** is intended to encourage members of ethnic minorities to complete doctoral degrees in anthropology, thereby increasing diversity in the discipline and/or promoting research on issues of concern among minority populations. Dissertation topics in all areas of the discipline are welcome. Doctoral students who require financial assistance to complete the write-up phase of the dissertation are urged to apply. A nonrenewable dissertation fellowship of \$10,000 will be provided annually to one anthropology graduate student. An applicant must be: (1) a US citizen; (2) a member of an historically underrepresented ethnic minority group, including, but not limited to: African Americans, Alaskan Natives, American Indians or Native Americans, Asian Americans, Latino/as, Chicano/as, and Pacific Islanders; (3) enrolled in a full-time academic program leading to a doctoral degree in anthropology at the time of application (4) admitted to degree candidacy before the dissertation fellowship is awarded; and (5) a member of the American Anthropological Association. The dissertation proposal must be approved by the applicant's committee prior to application. Students of any subfield or specialty in anthropology will receive equal consideration. For more information, visit: <http://www.aaanet.org/committees/minority/minordis.htm>. Complete Applications must be received by February 15th. Completed application packages should be sent to: American Anthropological Association, Minority Dissertation Fellowship Program, 2200 Wilson Blvd., Suite 600, Arlington, VA 22201-3357.

Society for American Archaeology Dienje Kenyon Fellowship. A fellowship in honor of the late Dienje M. E. Kenyon is offered through the Society for American Archaeology to support the research of women archaeologists in the early stages of their graduate training. The award, of \$500, will be made to a student pursuing research in Zooarchaeology, which was Kenyon's specialty. To qualify for the award, applicants must be enrolled in a graduate degree program focusing on Archaeology with the intention of receiving either the M.A. or Ph.D. on a topic related to Zooarchaeology, and must be in the first two years of graduate studies. Applications are to consist of: 1. a statement of proposed research related to Zooarchaeology, toward the conduct of which the award would be applied, of no more than 1500 words, including a brief statement indicating how the award would be spent in support of that research; 2. a curriculum vitae; and 3. two letters of support from individuals familiar with the applicant's work and research potential. One of these letters must be from the student's primary advisor, and must indicate the year in which the applicant began graduate studies. Strong preference will

be given to students working with faculty members with zooarchaeological expertise. Applications, preferably sent via email as an attachment in Microsoft Word, are due no later than January 7, 2005, and are to be sent to Heidi Katz, Thinking Strings, P. O. Box 537, South Orange, NJ 07079, hkatz@thinkingstrings.com.

Each year the **Wiener Laboratory of the American School of Classical Studies at Athens** offers four fellowships in the fields of human skeletal studies, faunal studies, geoarchaeology, and environmental studies. The fellowships are open to scholars with a Ph.D. and those working on a doctoral dissertation; a stipend of approximately \$15,500 to \$25,000 will be awarded depending on seniority and experience. Applicants must have a well-defined project addressing significant archaeological questions that can be undertaken in the Wiener laboratory within the academic year. The J. Lawrence Angel Fellowship in Human Skeletal Studies is specifically for the study of human skeletal remains from archaeological contexts in Greece; similarly, the Research Fellowship in Faunal Studies is for the study of faunal remains from archaeological contexts in Greece. The Research Fellowship in Geoarchaeology is for individuals whose projects address significant archaeological questions in areas of study which may include quarried stone, lithics, building materials, ceramics, soil and sediment studies. Finally, the Research Fellowship in Environmental Studies is for individuals studying an aspect of the environment such as archaeobotanical studies or specifically the study of seeds, charcoal, phytoliths, pollen etc. from archaeological contexts in Greece. In addition to the proposed research, the Fellow, as a member of the School will be expected to contribute to the development of the Lab's comparative or other collections, assist with queries from excavators, offer a lecture on the work undertaken while at the Lab, participate in one School trip, and contribute to seminars on aspects of archaeological science as part of the American School's annual curriculum. The deadline for applications is 15 January, annually; further details are available from <http://www.ascsa.edu.gr/Wiener/fellowship.htm>.

Conference News and Announcements

The **Southeast Conference on Mesoamerican Archaeology and Ethnohistory** will be held at the University of South Florida in Tampa on Saturday, February 12, 2005. The event will include 20 presentations from Mesoamerican archaeologists, art historians, and ethnohistorians from the greater Southeastern United States who will report on active investigations of precolumbian and early colonial Mesoamerican societies. The keynote speaker will be Dr. David Grove from the University of Florida. For complete details, visit <http://uweb.cas.usf.edu/~cwell/SECMAE.htm>.

The **Society for Anthropological Sciences General Scholarly Meeting** will take place February 23-27, 2005 in Santa Fe, New Mexico, in conjunction with the meetings of the Society for Cross Cultural Research. The URL for the meeting is

<http://anthrosciences.org/sasci-sccr/index.html>). This general scholarly meeting is focused on current research and on an effective exchange of ideas, theoretical insights, theoretical systems, methods, and payoffs of anthropological science. Volunteered papers or symposia on any aspect of anthropological science are welcome. Workshops and discussion groups are also welcome. For more details, see the website or contact David Kronenfeld, david.kronenfeld@ucr.edu.

The **19th International Radiocarbon Conference** will be held in Oxford, 3-7 April 2006. Accommodations and conference sessions will be held at Keble College, close to the center of the University. Further announcements about the conference will be posted on the conference website: <http://www.rlaha.ox.ac.uk/orau/conference.html>. If you have suggestions for special sessions or workshops please contact the organizers at orau@rlaha.ox.ac.uk.

With support from the National Science Foundation, MIT will convene the fourth annual **Summer Institute in the Materials Science of Material Culture (SIMSMC)**. Fifteen faculty members from liberal arts colleges around the country, representing fields from art history to physics, will participate during the two-week period, 6-17 June 2005. Working together with these colleagues, the MIT SIMSMC faculty demonstrate, through modules that explore materials engineering in the context of material culture, how undergraduate teaching can incorporate the subject matter of materials science in imaginative and intellectually stimulating ways that are congruent with and relevant to the pursuits of liberal arts institutions. The two modules that will be presented at the June 2005 SIMSMC are: *The Power of Metal in the Andean World* (Heather Lechtman) and *Form, Function and Aesthetics in Colonial New England: The Use of Wood for Furniture, Houses and Boats* (John Vander Sande, Samuel Allen). Our template joins archaeology and materials science and engineering, but art history, classics, environmental science, geography, history and other fields are all excellent vehicles for providing students with an integrated educational experience as they explore the relations between people and their material world. SIMSMC pays participant expenses: round-trip travel to MIT, housing on campus, and meals. Visit the SIMSMC web site for an on-line APPLICATION FORM and further information: <http://web.mit.edu/materialculture/www>.

Conservation and Art Materials Encyclopedia Online

(text adapted from <http://www.ncptt.nps.gov/>)

Don't let the name fool you. The Conservation and Art Materials Encyclopedia Online, "CAMEO," promises to play much more than a small role as a reference tool for preservation professionals. Funded by a 1998 PTT Grant, the CAMEO electronic database compiles, defines, and disseminates technical information on the distinct collection of terms, materials, and techniques used in the fields of art conservation and historic preservation. According to Michele Derrick of the Museum of

Fine Arts (MFA) in Boston, the PTT Grant allowed the database to grow beyond its original programming.

"The database was formerly called the Conservation and Art Materials Dictionary," Derrick said. "While the database was originally conceived as a potential reference book, NCPTT provided the encouragement and financing to develop CAMEO as an interactive database." Additional resources and support from the MFA enabled a draft version of the database to be placed on the Internet in November 2000.

CAMEO's breadth of information is what sets it apart from other sites that target specific audiences with highly-detailed, but narrowly-focused information. By cross-referencing and providing contexts for the preservation research included in the database, researchers with a narrow focus can discover a broader view of their subject matter. Derrick says this holistic understanding is important.

"The art conservation and historic preservation fields rely implicitly on knowledge gained from education, experience, colleagues, and reference sources in order to interpret material evidence on artifacts and understand its context within our cultural heritage," she said. "This knowledge base is necessarily broad because artifacts, sites, and treatment methods can include any combination of materials that have been used in the history of mankind." CAMEO is not the first online database to address the needs of materials preservationists; however, most have either become obsolete or contain one-sentence descriptions. The database's ability to grow also enables it to account for ever more complex technical and analytical processes, as well new materials and trends in preservation.

Another advantage is that CAMEO may furnish a means of collaboration and co-operation between varying departments within museums by providing a common set of terminology used in preparing and interpreting reports and publications. MFA is maintaining CAMEO as a free service to benefit professional conservators, the museum community, and the general public. However, changes to enhance the database's ease of use should make it more accessible to students and professionals in other fields such as art history architecture, journalism and library science.

SAS report on Archaeometry 2004

Ruth Ann Armitage Eastern Michigan University

The 34th International Symposium on Archaeometry was held in Zaragoza, Spain 3-7 May 2004. The meeting was organized by the Department of Analytical Chemistry at the University of Zaragoza with the Patrimoni-UB Group at the University of Barcelona. Held in the spectacular Luis Galve Hall at the Congress Center Auditorium, the meeting attracted 250 participants from around the world. Nearly 32% of those attending were students. Most of the participants were from Europe (88%); the rest were from North America (7%), Asia (4%), South America (0.4%), and Africa (0.4%). Six regular sessions were held covering Field archaeology; Technology and provenance of stone, pigments and plasters; Biomaterials; Technology and provenance of metals; Dating; and Technology and provenance of ceramics and glass. A special sponsored

session on the evolution and technology of glazes was also a part of the program. During these sessions, 192 posters and 77 oral presentations were given. Three student posters were selected for special recognition. The Martin Aitken Prizes were awarded to Myrto Georgakopoulou (Institute of Archaeology, University College London) for "Early Cycladic Metallurgy in a Settlement Context: Examination of Metallurgical Remains from the Site of Kavos (Cyclades, Greece)", and to Christina Henshaw and Thilo Rehren (Institute of Archaeology, University College London) for "Early Islamic Glazed Pottery from Akhsiket/Uzbekistan." SAS presented the R.E. Taylor Student Poster Award to the same poster by Georgakopoulou and to Alessandra Pecci (Universita di Siena) and Federico Marazzi (Istituto Universitario Suor Orsola Benincasa) for "Chemical Residues of Cooking Activities in San Vincenzo al Volturno (Italy)."

In addition to the stimulating academic atmosphere, the conference included several social activities. On Tuesday, we visited the Roman Theatre in the center of Zaragoza, where we were able to explore the museum and walk through the excavated ruins. Following lunch on Wednesday, tour buses took us through the city and to the La Seo Cathedral, where Romanesque and Gothic styles met *mudejar* tile work, and then to the Aljafería Palace, built in the 11th century and a highlight of Islamic Medieval architecture in the Aragón region. Thursday evening's conference dinner was held at the Club Náutico on the banks of the Ebro River. Part of the festivities of the evening included a farewell to Mike Tite as he stepped down as the chairman of the ISA Standing Committee, passing the reins on to Yannis Maniatis. The food, wine, and celebration were followed by music and dancing.

At the conclusion of the conference, the locations for the next Symposia were announced. The 35th ISA is scheduled for 10-15 May 2005 in Beijing, China; further information on the meeting is now available at <http://www.archaeometry.ustc.edu.cn/index.htm>. In 2006, the 36th ISA will be held in Quebec City, Quebec (Canada) the week of 2 May. Possible sites for the 2008 meeting include Siena (Italy), Cardiff (Wales), or Germany.

Archaeological Sciences of the Americas Symposium

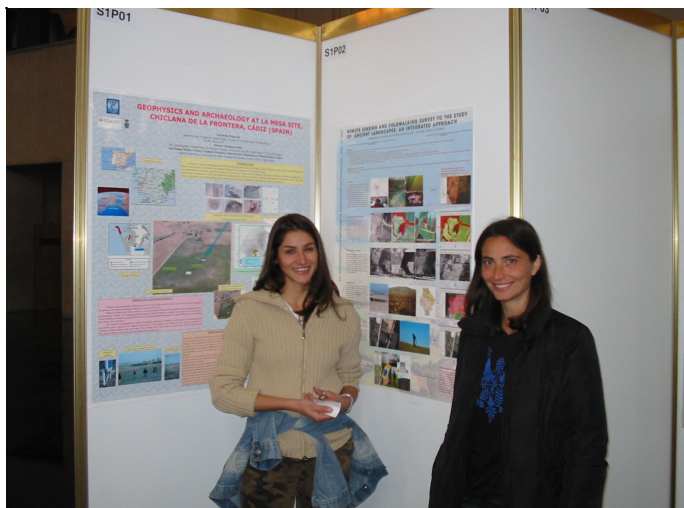
A.J. Vonarx, University of Arizona

The Inaugural Archaeological Science of the Americas Conference was held in Tucson, Arizona, between September 23 and 26, 2004 on the campus of the University of Arizona. The roster of 300 participants included students and professionals from eight countries with academic, government, institutional, and private affiliations. Paper and poster sessions were organized on the basis of five broad topics: material culture studies, chronometry, conservation, human/environmental interactions, and geoarchaeology. The event's principal sponsors included the NSF IGERT Program in Archaeological Sciences at the University of Arizona, the University of Arizona College of Science, the Society for Archaeological Sciences, Desert Archaeology Inc., Statistical Research Inc., and SWCA Environmental Consultants. R. Emerson Howell, Kanani Paraso, and A.J. Vonarx (graduate students from Arizona) initiated and organized the symposium.

Three public lectures were scheduled as part of ASAS. A. M. Pollard (Edward Hall Professor of Archaeological Science and Director of the Research Laboratory for Archaeology, Oxford University, UK) delivered "Putting Infinity Up On Trial: the Science of Archaeology," Patricia Fournier (Professor, Escuela Nacional de Antropología e Historia, Mexico City, Mexico) spoke on "New Insights from the Epiclassic Period in Central Mesoamerica: A Reevaluation of Coyotlatelco Ceramics," and Pamela Vandiver (Professor of Materials Science and Anthropology, University of Arizona) presented "Is Intangible Cultural Property a Concern to Archaeological Scientists?"

Congratulations to the winners of Student Poster Awards presented by the SAS: Heather Adkins (University of Northern Arizona, "Prehistoric Agricultural Viability of the Sacred Mountains Agricultural Complex, Verde Valley, Arizona"), Samuel Duwe and Amanda Reynolds (co-authors, University of Arizona, "Considerations for Provenancing Ceramics in the American Southwest: Chemistry, Temper, and Contamination." Tucson contract firms funded four competitive student travel grants. These were awarded to Niklas Schulze (Universidad Autónoma de México), Elizabeth Robertson (University of Calgary), Laura Limata (Lehigh University), and Ellery Frahm (University of Minnesota, Twin Cities).

Papers on Material Culture Studies: "The Ancient Trade in Mediterranean Black Gold: Scientific Applications in Obsidian Sourcing" by Robert H. Tykot (University of South Florida); "Hohokam Obsidian Procurement and Distribution in the Middle Gila River Valley: A Regional Approach" by Chris Loendorf, J. Andrew Darling (both from CRMP, Gila River Indian Community) and M. Steven Shackley (University of California, Berkeley); "Heat Treatment and Jasper Color Change: Implications for Understanding the Prehistoric Use of Bald Eagle Jasper in Pennsylvania" by Bradford Andrews (Alpine Archaeological Consultants, Inc.) and Barry Scheetz (Penn State); "Laser Ablation ICP-MS Characterization of Archaeological Materials for Provenance-Based Research" by Robert J. Speakman, Michael D. Glascock, Christopher



Alessandra Pecci (right)

Descantes, Kyra M. Lienhop, Barry J. Higgins, (all from MURR), Robert H. Tykot (University of South Florida), Jennifer J. Thatcher, and Craig E. Skinner (both from Northwest Obsidian Research Laboratory); “Laminates in Ancient Mesoamerica: Insights into a Newly Identified Craft Material” by Harriet F. Beaubien (Smithsonian Center for Materials Research and Education); “Ceramic Kiln Wastes Compositional Analysis Using ICP-AES and ICP-MS” by Yves Monette (Célat, Université Laval, Québec, Canada); “Examining Intra-regional Interaction Patterns, Using Laser Ablation-ICP-MS on Ceramic Paste in the Virgin Branch Anasazi” by Sachiko Sakai (University of California, Santa Barbara); “The Copper Bells of the Templo Mayor of Tenochtitlan Mexico: Cultural Influences on the Production Process” by Niklas Schulze (Universidad Nacional Autónoma de México); “Synchrotron Applications in Archaeometallurgy: Analysis of High Zinc Brass Astrolabes” by Brian Newbury, Michael Notis, G. S. Cargill III (all from Lehigh University), Bruce Stephenson (Adler Planetarium and Astronomy Museum), Jon Almer, Dean Haeffner, and Brian Stephenson (all from Argonne National Laboratory); “Technology of Medieval English Shears” by Laura Limata, Mike Notis (both of Lehigh) and Aaron Shugar (Lehigh University and Smithsonian Center for Materials Research and Education).

Other works in Material Culture Studies: “Integrating Radiocarbon Data and Archaeometallurgical Analyses: New Vistas Regarding the Development of Copper Metallurgy in the Chalcolithic Period” by Christopher J. Gohm (University of Toronto); “Early Copper Metallurgy in the Western Sahel: New Evidence from the Middle Senegal River” by Thomas Fenn (Arizona); “Analysis of Use-Life Distributions Using Mathematical Failure Models: Application to Ethnoarchaeological Data from Michoacán, Mexico” by Michael Shott (University of Northern Iowa); “Manganese Dioxide Accretions: Morphological, Chemical, and Analytical Characterization of Accretions Found on West Mexican and Chihuahua Ceramics: How They Inform the Archaeologist, Conservator, and Curator” by Caitlin O’Grady (Arizona); “Using a Portable, Non-destructive PIMA SP Spectrometer to Source Archaeological Materials and Detect Restorations in Museum Objects” by Sarah U. Wisseman (ATAM, University of Illinois at Urbana-Champaign); Mary R. Hynes, Thomas E. Emerson (both at Illinois Transportation Archaeological Research Program), and Randall E. Hughes (ITARP); “Investigating the Effects of Environmental Diagenesis on Ceramic Materials” Rachel S. Popelka, J. David Robertson, Michael D. Glascock, and Barry Higgins (University of Missouri, Columbia); “Typo-technological Character of Chalcolithic Black-and-Red Ware from North Gujarat : An Evaluation through Paste Characterization” by Kajal Shah (The Maharaja Sayajirao University of Baroda Gujarat, India); “Using Comprehensive Image Analysis Packages to Support Anthropological Application of Ceramic Thin-Section Petrography” by Chandra L. Reedy (University of Delaware).

Chronometry: “Luminescence Dating of Irrigation Canal Features” by Glenn W. Berger (Desert Research Institute); “Use of Altered Peyote in Antiquity” By Martin Terry, Karen L. Steelman, Phil Dering, Marvin W. Rowe (all from Texas A

& M), and Tom Guilderson (Lawrence Livermore National Laboratory); “Expanded Applications for Dendrochronology in Archaeology: An Ecological Interface” by James H. Speer (Indiana State University and Karla Hansen Speer (Washington University); “Non-Destructive Radiocarbon Dating: Naturally Mummified Infant Bundle from SW Texas” Karen L. Steelman, Marvin W. Rowe (both pf Texas A & M), Solveig A. Turpin, Laura Nightengale (both at University of Texas, Austin) and Tom Guilderson (Lawrence Livermore National Laboratory); “Calibration of the Radiocarbon Time Scale: Current Issues and Problems” R. E. Taylor (University of California, Riverside) and John R. Southon (University of California, Irvine); “Characterization of Freshwater and Marine Radiocarbon Corrections at Elk Hills, Kern County, California” by Brendan J. Culleton (Pacific Legacy, Inc.); “Effects of Glacial Melt on Radiocarbon Dating at the Terminal Pleistocene” by Britt Starkovich (Arizona); “Dendrochemical Analysis of Trees Affected by Cinder Cone Eruptions: A New Technique for Re-analyzing the Sunset Crater Eruption” by Paul R. Sheppard (Arizona), Mark Elson (Desert Archaeology, Inc.) Michael Ort, Kirk Anderson (both of Northern Arizona University). and Jeff Speakman (MURR).

Human Environmental Interactions: “Ancient DNA and Archaeofaunal Analysis: A Molecular Genetic Approach to Prehistoric Prey Choice” by R. Kelly Beck (University of Utah); “Stable Isotopes in Animal Bones, Human Impacts on Prey Populations, and ‘Garden Hunting’ in the Mimbres Valley, New Mexico” by Mike Cannon (California State University, Long Beach); “Fish Heads, Fish Heads: Activity Area Analysis in Contemporary Yup’ik Fish Camps in Western Alaska Through Chemical Characterization of Soils” by Kelly J. Knudson, T. Douglas Price (both of University of Wisconsin at Madison), Lisa Frink (University of Nevada at Las Vegas), and Brian Hoffman (Hamline University); “Holding Water in the Desert: A Multidisciplinary Approach to Studying Hohokam Reservoirs” by Bruce G. Phillips and Andrea R. Miller (Archaeological Consulting Services, Ltd); Manuel R. Palacios-Fest (Statistical Research, Inc.), and Saxon Sharpe (Desert Research Institute), “Zooarchaeology and Global Climate Change: Establishing Contemporary Relevance for Ancient Faunal Records” by David Yesner (University of Alaska); “Buffalo Chips in the Mammoth Patch” by Leland C. Bement (University of Oklahoma); “Analysis of Macrobotanical Remains at the La Playa Site, Sonora, Mexico” by Natalia Martinez (Universidad de las Américas) and Guadalupe Sánchez (Arizona); “Implications of Anthropogenic Fire and Landscape Management on Prehistoric Plant Economies in the Upland Southwest” by Christopher I. Roos (Arizona), Alan P. Sullivan III (University of Cincinnati), and Calla McNamee (University of Calgary); “Flamers of Contention: Investigation and Simulation of Ancient Structural Fires at Chevelon Pueblo” by A.J. Vonarx and E. Charles Adams (Arizona), “Demography in the Southwest: Migration, Coalescence, and Hohokam Population Decline” by J. Brett Hill, Jeffery J. Clark, William H. Doelle, and Patrick J. Lyons (Center for Desert Archaeology Inc.); “Soil Properties and Archaeological Implications of Classic Period Hohokam Adobe Architecture” by R. Emerson Howell (Arizona) and Jeffrey A. Homburg (Statistical Research,

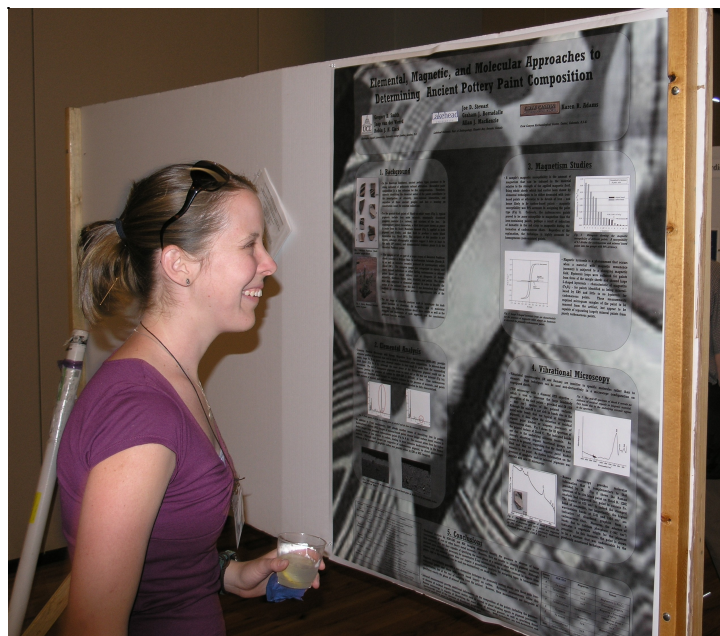
Inc); "The Lure of the City: A Strontium Isotope Study of Migration to Tikal, Guatemala" by Lori E. Wright (Texas A & M); "Micromorphology of Construction and Culture at La Trinidad, Peten, Guatemala" by Ellen Spensley (Boston University); "The Use of Forest Products in Turquoise Mosaics from Pre-Hispanic Mexico: Botanical Sources and Analytical Challenges" by Rebecca J. Stacey and Caroline R. Cartwright (British Museum).

Geoarchaeology: "Archaeological Implications of Holocene Geomorphology and Paleoenvironment in the Cypress Hills of Southeastern Alberta" by Elizabeth Robertson (University of Calgary); "Cactus Hill Through Blueberry Hill to Chub Sandhill: A Search for Buried Pre-Clovis/Clovis Occupation Levels in the Atlantic Coastal Plain of Virginia" by Michael F. Johnson (Fairfax County Park Authority, Resource Management Division); "Morphological Evidence for Burned Features at Pech de l'Azé IV, Dordogne, France" by Susan Mentzer (Arizona) and Paul Goldberg (Boston University); "Paleohydraulics and Paleohydrochemistry of Prehistoric Irrigation Canals in Tucson and Phoenix, Arizona" Manuel R. Palacios-Fest, Jonathan B. Mabry (Statistical Research, Inc.), and Bruce G. Phillips (Archaeological Consulting Services); "Comparison of the Scale of Hohokam Canal Systems in the Salt and Gila River Valleys, South-Central Arizona" by M. Kyle Woodson (CRMP, Gila River Indian Community); "Climate Change and the Late Archaic to Early Woodland Transition in the Mississippi River Basin" by Tristram R. Kidder (Washington University); "Groundtruthing Archaeoclimatic Models Using Pollen Profiles from Paleoindian Sites in the Western United States" by R. A. Varney and Linda Scott Cummings (Paleoresearch Institute, Golden CO).

Spatial Analysis: "The Application of Near Surface Remote Sensing in Archaeological Research Design" by Carl Lipo and Daniel O. Larson (California State University, Long Beach); "Imaging Sub-surface Features of the Miami Circle with Ground Penetrating Radar" by Jessie Pincus, Dean Whitman (Florida International University), and Robert S. Carr (Archaeological and Historical Conservancy of Florida); "The Ancient Roads of Colossal Chiefs" by Terry L. Hunt (University of Hawai'i-Manoa) and Carl P. Lipo (California State University Long Beach); "Subsurface Remote Sensing at Tiffany Pueblo, New Mexico" by Chris M. Rohe (Statistical Research, Inc.); "Ground-Penetrating Radar at the Landscape Scale: New Challenges and Possible Solutions" by Eileen G. Ernenwein and Kenneth L. Kvamme (University of Arkansas); "The Spatial Analysis of Geochemical Data from a Contemporary Household-Scale Pottery Workshop in Cuentepec, Morelos, Mexico" by Christopher D. Dore (Statistical Research, Inc) and Sandra L. López Varela (Aútonoma del Estado de Morelos); "The Georgetown Cemetery: Integrating Remote Sensing, Database Management and GIS" by Mona C. Charles, Haley Harms (both of Fort Lewis College), and Christine Markussen (University of Arkansas); "Mobile GIS on Archaeological Survey and the Mixed Blessings of a New Technology" by Nicholas Tripcevich (University of California, Santa Barbara); "Archaeological Investigation in Media Aguas, Veracruz, Mexico" by Roberto Lunagómez Reyes and Mitsuru Kurosaki Maekawa

(Universidad Veracruzana); "Beyond Cultural Resource Management: Statewide Geographic Information Systems Role in Elucidating Regional Archaeological Research Questions" by Philip B. Mink, II (Kentucky Archaeological Survey), A. Gwynn Henderson (University of Kentucky), and David Pollack (University of Kentucky and Kentucky Heritage Council).

Discussants for topical sessions included faculty and researchers from the University of Arizona (Greg Hodgins, Jeffrey Dean, David Killick, Barbara Mills, Vance Holliday, Mary Stiner, Steven Kuhn, Barnet Pavao-Zuckerman, Daniela Triadan, Jay Quade, Gary Christopherson, Nancy Odegaard, and J. Jefferson Reid) with Doug Gann from The Center for Desert Archaeology. Attendees enjoyed a number of special events, including field trips to Paleoindian, Archaic, Historic, and Hohokam sites in southern Arizona and free entrance to the Arizona State Museum. In addition, guests were also treated to tours of laboratory facilities in the departments of Anthropology, Geosciences, Physics, Materials Science, and Geography at the University of Arizona. The organizers wish to extend special thanks to members of the SAS Executive Board who attended and helped with the event: Greg Hodgins, Aaron Shugar, Robert Tykot, and Arleyn Simon and Sarah Wisseman. Also special thanks to the NSF IGERT Program in Archaeological Science at the University of Arizona (UA), UA College of Science, UA Foundation, UA Department of Physics and AMS Radiocarbon Laboratory, UA Laboratory of Tree Ring Research, UA Department of Geography, UA Graduate College, Desert Archaeology, Inc., Statistical Research, Inc., SWCA, Inc. Environmental Consultants, Arizona Archaeological Council, and Arizona Archaeological and Historical Society. A second ASAS conference is in the works for 2006 and electronic publications from the 2004 event will be available in January at <http://web.arizona.edu/~anthro/asa.shtml>.



Lizzy May, a University of Arizona graduate student, peruses a poster at the Archaeological Sciences of the Americas Symposium in September, 2004

**Society for Archaeological Sciences,
Minutes for General Meeting
69th Annual Meeting of the
Society for American Archaeology
Montreal, Quebec, Canada**

Recorded by A.J. Vonarx, University of Arizona

In attendance: Greg Hodgins, Arleyn Simon, Aaron Shugar, Tatsuya Murakami, Robert Tykot, RE Taylor, Jim Burton, Andrew Millard, AJT Jull, Michael Glascock, Charles Kolb, Christian Wells, Destiny Crider, AJ Vonarx

I. Call to order: President Greg Hodgins

Minutes from April 10, 2003 meeting at 68th Annual SAA Meetings in Milwaukee, Wisconsin reviewed and accepted.

II. SAS (1977-present)

Past President Arleyn Simon read a commentary and retrospective, written by Rob Sternberg, in commemoration of the 25th Anniversary of the Society. RE Taylor was congratulated on his being honored through the 2004 Fryxell Symposium.

III. Reports from Officers/ Old Business

President's Report

- Report provided by President Hodgins highlights of recent news and new directions.
- Robert Tykot will head development of upcoming SAS book/volume series.
- Christian Wells will gradually assume editorship of SAS Bulletin.
- Rob Sternberg will fulfill duties of General Secretary, as position that will combine responsibilities of Secretary and Treasurer combined position. Burton's former post of SASWeb coordinator will be transferred to a yet unnamed successor.
- Hodgins thanked all officers for their service and emphasized the importance of working to pass on accumulated knowledge to new officers.
- RE Taylor Student Poster award to be given at both SAA and ISA meetings this year.

Finances

- Copy of 2003 budget and proposed 2004 budget, passed on from Robert Sternberg, and was circulated. Projected budget based on 300 member target.
- Jim Burton noted the change in the cost of web service (hosted by the University of Wisconsin) to \$300.
- Motion to accept the budget was seconded and passed.

Membership

- Christian Wells submitted the 2003 report into record and announced that there were 14 submissions for the R.E. Taylor Poster Award for the SAAs, and encouraged initiatives to involve student members in society projects, particularly through direct contact with potential members.

- Increase in number of student members noted over the past year.

Publications

- Rob Tykot presented report and reminded attendees that back issues of the SAA newsletter are now available on CD.
- Discussed the high cost (\$2.00/issue) of mailing newsletter overseas. Recommended offering members a choice of whether to receive printed newsletter or access electronically.
- SASweb and SASnet***
- Jim Burton submitted report and asked for assistance in recruitment of new SAS Internet Coordinator.
- SASnet has been relatively quiet of late – averaging 6 hit a month. Use of service for new job postings, symposia announcements was encouraged.
- SASweb averages 400 hits a day, rather consistent throughout the year (including summers). The nature of traffic is international, with 60 countries represented.
- Suggestion that upcoming web development might include use of services such as "Paypal" that allow members to renew, enroll, and pay online.
- R.E. Taylor suggested crosslinking with the International Archaeometry Symposium websites.
- Journals (Archaeometry, Journal of Archaeological Science) and Intersociety Relations***
- No reports available.

IV. New Business

Officers

- Robert Tykot appointed Chair of Publications.
- Christian Wells assumed Co-Editor of Bulletin Publication. Will assume full Chair responsibilities in next year (2005).
- Aaron Shugar named Chair of Elections.
- Nominations currently being accepted for positions as SASWeb/SASNet Coordinator, Intersociety Relations, and Membership Development and should be submitted to Aaron Shugar.

Amendments of Bylaws

A. Conducting Society Business by Email or Post

- Rob Sternberg submitted a request that wording of Society Bylaws (and Bylaw 7 regarding election ballots in particular be modified so that official business might be conducted through either email or post).
- Jull suggested that the wording be changed to "by written means" so as not to exclude members without regular email access.
- Motion advanced and passed.

B. General Review and Update of Bylaws

- President Hodgins suggested that the text of the bylaws be reviewed and updated. He appointed a three member team to the task: Aaron Shugar, R.E. Taylor, and Rob Sternberg. Hodgins asked that a report on progress be submitted by July.
- Archaeological Sciences of the Americas Meeting 2004***
- President Hodgins motioned that a \$500 donation be made to fund a speaker for the ASA conference to be held September

23 – 26, 2004 at the University of Arizona campus. The society's involvement in this student-strong conference will help in member recruitment and society visibility. The motion was seconded and passed.

SAS Publication Series

- Rob Tykot discussed the reestablishment of the SAS volume series formerly produced by Plenum Press. Upcoming projects slated to expand series beyond single author emphasis. This will be accomplished through publications of edited volumes, and undergraduate texts, and a series of treatments on archaeological science topics for general audiences.
- Alta Mira has been the focus of recent negotiations:
 - single/dual author overviews of general topics (such as Radiocarbon or Bone Chemistry) with sales potential for general audiences.
 - longer more technical works by single/dual authors
 - little interest in edited volumes
 - noted for prestige and strong presence in Europe
- Arleyn Simon encouraged talks with University of Utah as an alternative – more willing to publish edited volumes
- Details regarding the specifics of a contract with Utah are still unavailable.
- Tim Jull asked that Print on Demand and less conventional arrangements be entertained.
- Motion to explore other publication arrangement with a variety of publishers, including Alta Mira and others made, seconded, and passed.

Society's Stand on Authenticating Unprovenanced Art and Artifacts

- President Hodgins mentioned a letter from Art Professor Harroff, asking for the Society's help in authenticating works of art.
- Aaron Shugar suggested that the Society create a forum for discussion of this issue in the coming year.

V. Next Meeting

The next meeting will be held during the ISA meeting in Zaragoza, Spain in May, 2004. Another General Meeting will be held during the Society for American Archaeology Meetings in Salt Lake City, Utah in April, 2005.



SAS Business Meeting

Multi-elemental Analysis of Ancient Maya Pigments Reveals New Information on Political and Religious Rituals at Copán, Honduras

Karla L. Davis-Salazar, University of South Florida

This project focused on the documentation, conservation, and analysis of artifacts and other material residues from a series of Early Classic (ca. AD 400-600) ritual deposits at the Classic Maya site of Copán in western Honduras. The Early Classic offerings in question were associated with a hieroglyphic monument and burial (field name, "Motmot") found beneath the pyramid of the Hieroglyphic Stairway in the civic-ceremonial center of the site. The sequence of ritual deposits demonstrates a remarkable correspondence with events recounted in the hieroglyphic inscription on the monument that marks the location of the burial. The primary objective of this project was to provide detailed documentation of the Motmot artifacts as well as to identify other material residues (primarily pigments) associated with the Motmot marker in order to yield additional data that can be evaluated against known textual and contextual information. This work will allow us to identify patterns in the relationship between material culture and politico-ritual activity at Copán, and ultimately to investigate broader issues about the ritual behaviors that sustained institutionalized kingship in the Maya lowlands during the Early Classic.

The Motmot burial consists of a circular cobblestone cist located 3.5 m in front of a building decorated with painted stucco. The occupant of the cist was a young woman who was originally placed seated, in a cross-legged position, on a woven mat. The contents consisted of eleven ceramic vessels, fourteen pieces of carved jade, worked and unworked shell, a deer antler, coral, stingray spines, and liquid mercury, as well as the skeletal remains of several different animal species and a decapitated human skull. The contents of the cist were significantly disturbed, suggesting that it had been re-entered sometime after the initial burial of the woman.

The burial was marked by a carved limestone monument equal in diameter to the cylindrical cist, set in the stucco plaza floor covering the cist. Carved on the marker, two individuals sit facing one another, separated by a double-column inscription. The figures are identified as K'inich Yax K'uk' Mo' ("Sun-eyed First/Blue-green Quetzal Macaw"), the founder of the Copán dynasty, and his son, Ruler 2. The hieroglyphic text bears the date of 9.0.0.0.0., or A.D. 435. On top of the marker, debris relating to the ritual termination of the marker, which appears to have included some kind of smoking or burning, produced over 500 samples of pigments, feathers, carbon, squash seeds, and other materials within a 5-8 cm layer. This layer was capped by an arrangement, in the center, of three stones, a *Spondylus* shell, and feathers, as well as four large jade earflares, each placed at one of the four cardinal points.

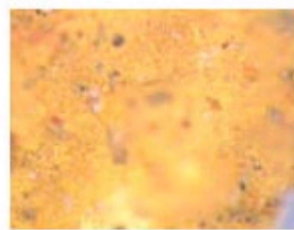
The many pigments and macrobotanical remains found in the deposits suggests that perishable objects were an integral component of the activities performed in this area. In order to

begin the process of identifying the materials used in the manufacture of those objects, 59 pigment samples taken from the material on top of the hieroglyphic marker were transported to the Center for Solid State Science at Arizona State University for macroscopic, microscopic, and chemical analyses. With funding from the Foundation for the Advancement of Mesoamerican Studies, Inc., optical microscopy, scanning-electron microscopy, and X-ray diffraction analysis, were performed by Dr. Hamdallah Béarat to identify major and minor elements and some trace elements in pigment samples.

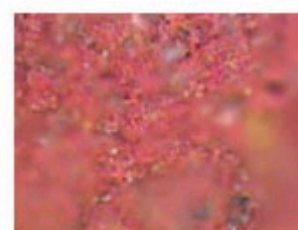
A total of six pigments were identified: two reds (cinnabar and hematite), two yellows (jarosite and goethite), one white (calcite), and one black (carbon). Quartz, montmorillonite (a clay mineral), and plagioclase feldspar were also identified in the samples. The carbon likely resulted from the fire that seems to have occurred on top of the monument during the termination ritual, as evidenced by the ash and carbon visible in the debris during excavation. The calcite may derive from the stucco floor into which the monument was set. Most interesting, however, is the fact that, if there had been any kind of burning on top of the monument, there would have been no evidence of jarosite and goethite (the yellow pigments). According to Béarat, with fire, jarosite and goethite change chemical composition and color. So the burning noted during excavation on top of the marker either would have had to have occurred before those pigments were placed there, or whatever was burned would have had to have been burned elsewhere and then placed on top of the marker.

The macroscopic, microscopic, and chemical analyses suggest three important points, which have implications not only for the interpretation of data related specifically to the Copán deposits but also for future research carried out at Copán and other Maya sites. First, these analyses, which indicated the presence of two minerals (jarosite and goethite) not normally found under conditions of extreme heat, have elucidated possible additional steps in the deposition of objects during the termination ritual on top of the Motmot marker and hence in the behaviors that produced the archaeological record.

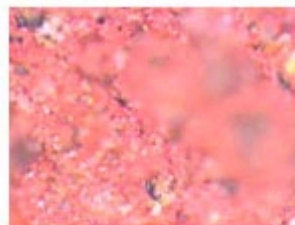
Second, while the use of cinnabar and hematite as red-colored pigments is not uncommon or unknown at Classic Maya



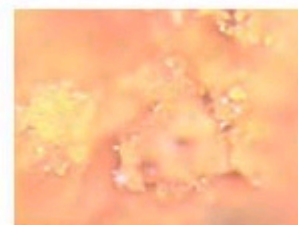
goethite



cinnabar



hematite



jarosite

Images of pigments taken using optical microscopy

sites, the detection, by chemical analysis, of both minerals in a single deposit suggests that there may have been different uses for the two minerals. Whether these different uses pertain to differences in the hues and tones of the two colors produced by the minerals or in other physical properties and/or meanings attached to the minerals remains to be determined. However, it is interesting to note that the use of hematite was restricted to the area covering Copán's dynastic founder, while cinnabar was used throughout the deposit. More broadly, the use of reds and yellows in this deposit may be linked to the colors of the feathers of the quetzal (k'uk') and scarlet macaw (mo'), which compose the phonetic components of the founder's name, Yax K'uk' Mo'.

Third, the results of the analyses point to the importance of interdisciplinary research that balances archaeological observation with material science techniques. For example, the detailed and meticulous excavation of the termination debris on top of the Motmot marker performed by Barbara Fash and colleagues revealed numerous areas of color concentrations visible to the naked eye. However, chemical analysis of these sampled areas often indicated a different, dominant pigment, primarily cinnabar. For example, a yellowish area on the ground was revealed chemically to be composed primarily of cinnabar (red). Further, the size and shape of the pigment granules suggest that they are not the remains of paint that decorated perishable organic material, as is often assumed. Rather, the granules were important as the chromatic components of the ritual deposit, as was the case with cinnabar in later offerings.

The new data contribute to the study of the structural form and depositional history of the Copán materials. In the case of the Motmot ritual assemblages, we have an opportunity to explore both specific politico-religious practices of Copanec kings and broader behavioral patterns related to the legitimization of Maya political authority. Future work will correlate these data with epigraphic and archaeological evidence to create a more complete picture of the relationship between political events and religious practices at Copán.



Hamdallah Béarat using optical microscopy

Archaeological Chemistry

Nora Reber, Associate Editor

Upcoming

The 22nd International Meeting on Organic Geochemistry will take place September 12-16, 2005 in Seville Spain. The deadline for abstracts is January 7, 2005, and applications in archaeology have been specifically solicited as part of the "New Trends in Organic Geochemistry" portion of the program. You may submit online at <http://www.imog05.org>, or download the brochure or paper forms for mailing.

The 70th Annual meeting of the SAA is planned for Salt Lake City March 30-April 3, 2005. Among the many symposia of interest to archaeological chemists, foremost could well be the symposia on Theory and Practice of Archaeological Residue analysis, planned by Han Barnard and Jelmer Eerkens. The two symposia include a large number of speakers in this contentious field, with informal debates moderated by the discussants planned as the finale of each session.

The 22nd Carbondale Visiting Scholar conference will take place sometime this spring, entitled "The Durable House: Architecture, Ancestors, and Origins." The Carbondale conference tries to bring together many different subfields, particularly archaeological chemistry and other scientific approaches to archaeology, along with anthropological and archaeological theory. Details, soon to include the date of the conference, are posted at <http://www.siu.edu/%7Ecai/vsprogram.htm>.

Symposia

Joseph B. Lambert, professor of chemistry at Northwestern University, was honored at the Edelstein Award Symposium at the August national meeting of the American Chemical Society in Philadelphia. The symposium highlighted the use of modern chemical methods to examine ancient artifacts and to uncover the processes of chemistry used by humans in the past, with a special emphasis on pigments and dyes. Mary Virginia Orna (ACS Journal of Chemical Education) described her research on ancient and medieval pigments and dyes, and the early chemist's manipulation of materials to develop unprecedented colors on manuscripts and paintings. Jacqueline Olin (Smithsonian Institution) reviewed the history of the chemistry of anatase, describing inks that were available during the first half of the fifteenth century, and proposed a new approach to understanding the Vindolanda Map. Kathryn Jakes (Ohio State University) described the use of textiles obtained from prehistoric North American sites as a means to uncover technology and human behavior of the people of the past. Complex fabric structures, made of yarns formed from fine plant fibers, and the addition of colorants indicate a wealth of knowledge of the prehistoric artisan/scientist. Electron spin resonance was reviewed by Anne Skinner (Williams College) and its usefulness in providing precise dating of inorganic objects was addressed. Lambert concluded the symposium with a presentation on the "Deep History of Chemistry," discussing human fire use, the first chemical process developed and controlled by humans and a key characteristic that distinguishes humans from other species of animals.

The Southeastern and Midwestern Archaeological conferences combined their annual meetings this year at St. Louis. A two-day symposium on "Recent Contributions to the Application of Ceramic Method and Theory in the Archaeology of the Midwest and Southeastern US," organized by Ann Cordell and Joe Herbert discussed archaeological chemistry as well as other types of ceramic analysis.

Special Issues

Mössbauer spectroscopy has been getting a lot of exposure recently, most notably in volume 154 of *Hyperfine Interactions*. "Mössbauer Spectroscopy in Archaeology Volume I," edited by U. Wagner, is a continuation of Volume II of the series, published as Volume 150 of that journal in 2003.

Books of Interest

Forensic Archaeology, Anthropology and the Investigation of Mass Graves, by Margaret Cox, is due out this January, with a paperback edition following at the end of March. *Physics Methods in Archaeometry: Proceedings of the International School of Physics "Enrico Fermi" Villa Monastero, 17-27 June 2003*, by M. Martini, M. Milazzo, and M. Placentini, came out this past June. Chemistry and physics are related, after all!

For those with an interest in soil chemistry, Vance Holliday's *Soils in Archaeological Research* was published this summer.

A 2nd hardcover edition of Zvi Goffer's popular *Archaeological Chemistry* book will be out in May.

On the more frivolous front, *Aspirin: The Remarkable Story of a Wonder Drug*, by Diarmuid Jeffreys, gives a chemical history of the drug that includes its Egyptian and Mesopotamian antecedents. Just the thing for a headache brought on by too much serious reading!

Remote Sensing and GIS

Apostolos Sarris, Associate Editor

Conferences

University of Crete in cooperation with National Center for Scientific Research "Demokritos" and Herakleion and Chania Archaeological Museums organize a Symposium on "Aegean Metallurgy in Bronze Age". The aim of this Symposium is to record the results of the recent researches and analyses and to bridge the gap between archaeologists and archaeometallurgists. The symposium will take place from 19 to 21 of November 2004 at the University of Crete, Department of History and Archaeology, Gallos Campus, Rethymnon, Crete. For details and questions contact to the following address: aegeanmetallurgy@yahoo.com. The abstracts of the Symposium are available in the address http://www.history-archaeology.uoc.gr/Aegean_metalurgy.htm.

Seeing the Past- Building knowledge of the past and present through acts of seeing is a conference designed to explore the act of seeing and how observation leads to certain types of knowledge. This conference explores how visual media are used to construct our knowledge of the past. It will engage in a

discussion of a wide range of forms, practices and theories of perception and the subsequent formation of knowledge in both the past and the present. Two large topics will be addressed: 1) Seeing the Past (in the present), which encompasses the ways in which we present the past through visual technologies and media to other scholars, the public and ourselves (GIS/Digital rendering of sites and monuments, visual modeling, the commercialization/packaging of the past, the past through photography/other media, how modern sites are used (i.e. heritage/ tourism), and how the past is represented in museums) and 2) Seeing the Past (in the past) which includes studies on how past peoples used visual culture to understand their past and present (temporal and spatial development of settlements and cemeteries, rock art, textual and artistic representations, monumentality, spatial re-use, ritualized architecture, and landscape studies). The conference will be hosted by the Archaeology Center at Stanford University (February 5 - 6, 2005). For details and questions contact to the following address: seeingthepast@yahoo.com

ISAP's Annual General Meeting for 2004 will be held on 14 December 2004 in London, in advance of two EIGG 2004 day-meetings, focusing on "Recent Work in Archaeological Geophysics" (15 December 2004) and "Forensic Remote Sensing and Geophysics" (16 December 2004). For more information please contact the Web address: <http://www.brad.ac.uk/acad/archsci/archprospection/ArchGeo04/>

The Institute for Technologies Applied to Cultural Heritage (ITABC-CNR), the International Society for Archaeological Prospection (ISAP) and the Special Project "Cultural Heritage" - CNR announced the organization of the 6th International Conference on Archaeological Prospection, which will be held in Rome, Italy, September 14-17, 2005. Topics of the conference include: a) Shallow depth determination, b) Integrated prospection methods, c) Processing, interpretation and visualisation of prospection data, d) Remote sensing, imaging and GIS, e) Natural risks and archaeological sites, f) Technical aspects, and g) Archaeological feedback. Deadline for abstracts is 31 January 2005. Accepted abstracts will be published, notification of acceptance will be issued on April 1, 2005. Further information can be obtained at <http://www.archeo2005.itabc.cnr.it>

The 9th Workshop on "Archaeologie & Computer" will be held at the City Hall of Vienna, Austria, during the period of 3rd - 5th November, 2004. Topics of the workshop include a) Tourism - Cultural Heritage - EDP, b) eXtensible Markup Language (XML), c) Digital Elevation Models (DEM), d) Looted Past - digitalized Future? - Hot spots in the Near East and the protection of cultural property - how can computers help? e) diverse (GIS, CAD, VR, Statistics, Internet, etc.). The schedule and the program of the Workshop can be found at: <http://www.magwien.gv.at/english/archaeology/>

The Association of Geographic Information Laboratories for Europe (AGILE) was established in early 1998 to promote academic teaching and research on GIS at the European level and to ensure the continuation of the networking activities that have emerged as a result of the EGIS Conferences and the European Science Foundation GISDATA Scientific Programmes. The next AGILE conference will take place in

Estoril, Portugal, from May 26-28 2005. Conference topics include among others, Data capture: issues and applications, Earth observation: issues and applications, GI education and training, Modelling of social processes and Web technologies. Deadline for the reception of abstracts is 01 December 2004. More information can be obtained in the following address: <http://www.agile-online.org/>.

Electronic Databases

The CSA-AIA Archaeological Project Database constitutes an internet resource providing information regarding current archaeological projects (descriptions, goals, contact information) from China to the Mediterranean. For more information, please contact Nick Eiteljorg (nicke@csanet.org) or Susan Jones (scjones@csanet.org).

International Society for Archaeological Prospection

The International Society for Archaeological Prospection was established as a result of the 5th International Conference on Archaeological Prospection in Cracow, Poland. "The object of the Society shall be to advance the education of the public in archaeology (including the man-made landscape and the built-environment) through the promotion of high standards of research, application and communication in the field of archaeological prospection and related studies. The Society's scope shall be international, both in activities and membership." The 2nd issue of the Newsletter of the Society was published on 28 August 2004 (High resolution GPR surveys for the study of "Domus del Centenario" - Pompei, Italy / GAI Archaeo-Geophysics Seminar, Dublin / Recent magnetometer surveys in Eastern Canada / Update from the Far East - Archaeological Prospection Society of Japan / "Lost chapel" of Henllan, Wales / News from Glasgow: a round-up of what's happening at the Department of Archaeology / Update from the UK & Eire / Noticeboard). Information about the International Society for Archaeological Prospection, and a membership application form, together with both issues of the Newsletter can be found in <http://www.bradford.ac.uk/archsci/archprospection/>

Software Updates

Geoscan Research has announced the latest version of Geoplot (3.00p), which is now available for download from www.geoscan-research.co.uk. Downloads are free of charge and available for both software and hardware (dongle) locks of Geoplot users. The latest version includes new Destagger facilities for dual gradiometers operated in zig-zag mode, new master grid facilities, additional Interpolate facilities, etc.

CALL FOR CONTRIBUTIONS

The *SAS Bulletin* Editors invite readers to contribute short research articles (1500 words or less), calls for papers and summaries of conferences on archaeological science, relevant news items, and information about jobs, grants, and fellowships in archaeometry. Submit materials electronically to Christian Wells, cwells@cas.usf.edu.



Archaeological Ceramics

Charles C. Kolb, Associate Editor

The column in this issue includes seven topics: 1) News; 2) Book Reviews on Archaeological Ceramics; 3) New Publications; 4) Other Publications; 5) Previous Meetings; 6) Internet Resources; and 7)

Miscellaneous News. Information on Forthcoming Meetings will be in the December issue.

News: SCMRE Appoints Director

Dr. Robert J. Koestler was appointed the new director of the Smithsonian Center for Materials Research and Education (SCMRE), effective August 30, 2004. Koestler is a cell biologist and electron microscopist known for his advancements in art conservation. He brings to the Smithsonian more than 30 years of museum experience, with an emphasis in the conservation of natural history collections and art objects. Koestler spent much of his career at the Metropolitan Museum of Art and the American Museum of Natural History in New York. A press release reports that "he is highly regarded as an excellent scientist and leader. As director, he will bring new research capabilities and focus to SCMRE's research and conservation and will work closely with the Smithsonian's museums. Dr. Koestler is known for his advancements in art conservation research, including quantification of biodeterioration and early detections systems, assessment of visual changes in material surfaces and control of insect and fungal infestations in objects. He developed a specialized method for eradicating these damaging organisms and has treated thousands of objects all over the world without harming the artworks or exposing conservators to dangerous chemicals. He has consulted on many projects worldwide for foundations, museums, collections and government conservation institutes and has served as an adjunct professor for New York University's Institute of Fine Arts Conservation Center. Dr. Koestler has appeared on the PBS program "Innovation and the BBC program "Nova" and is listed in the *Who's Who in Science and Engineering* in the 1993-1994 and 1995-1996 editions."

Reviews of Books on Archaeological Ceramics

Patterns and Process: A Festschrift in Honor of Dr. Edward V. Sayre, Lambertus van Zelst (ed.), Suitland, Maryland: Smithsonian Center for Materials Research and Education (SCMRE). 311 pp., no ISBN (errata sheet inserted, n = 8, for pp. 111-128), 2003. The majority of the papers presented in this Festschrift volume derive from oral presentations made at the symposium "Patterns and Process" held at the Smithsonian Institution 21-22 September 1998. (See *SAS Bulletin* 21(3):6-10 (Fall 1998), "Patterns and Process: A Two-day Symposium in Honor of Dr. Edward V. Sayre.") At that symposium, Ed Sayre was honored as a teacher, mentor, collaborator, and good friend to a multitude of researchers and practitioners in the fields of archaeological sciences, technical

studies in art history, and the conservation of cultural property. While at the Brookhaven National Laboratory's Chemistry Department and then at the Smithsonian Institution's Conservation Analytical Laboratory (CAL, the predecessor to SCMRE), he produced a seminal body of work that established the validity and feasibility of characterizing raw material sources of archaeological ceramics through the chemical analysis of the ceramics (INAA). He and his colleagues and their students helped to develop archaeometry into archaeological science. The volume was produced to honor Ed's contributions, not only to archaeology but also as a way of saying "thanks" for his contribution to our careers and lives. Since the book was produced with Federal funds and cannot be sold. Copies can be requested by contacting Ann N'Gadi, SCMRE, Smithsonian Institution, 4210 Silver Hill Road, Suitland, MD 20746, e-mail NGadiA@scmre.si.edu The volume has a frontispiece image of Ed Sayre on 22 September 1998 standing at a podium, presenting remarks about the symposium and thanking his colleagues. A Preface (pp. 7-9) provides background to Sayre and the festschrift. In all there are 17 chapters written by 27 authors, and the narratives are accompanied by 132 figures and 31 tables. Each chapter is accompanied by the authors' personal reminiscence of Ed Sayre, and each chapter has its own bibliography.

The initial contribution is "Ed Sayre So Far" by Frederick R. Matson (pp. 10-16), who provided a biographical sketch of Sayre from his early days in Des Moines, Iowa to his work on the Manhattan Project and then at Eastman-Kodak before joining Brookhaven in 1952 where he remained until his "retirement" in 1984 and his new career at the Smithsonian CAL. Sayre's bibliography includes 110 papers published from 1949 through 1995. Since 1959 his research has focused on archaeometric subjects (pottery, figurines, glass, paintings, silver, wool, paper, and bronzes among other material culture). A few minor errors have crept into the text, e.g., College Station, PA (p. 11) should be University Park, PA. "A Social History of Archaeological Materials Characterization Studies" by Marilyn Beaudry-Corbett (pp. 19-25) begins with Sayre's seminal 1959 paper on activation analysis applied to art objects and archaeological materials, and moves to a discussion about archaeometry, archaeomaterials, and archaeological science as seen in Robert Dunnell's assessment of Pam Vandiver's edited volume *Material Issues in Art and Archaeology IV* (1995). While correct in the bibliography, the text incorrectly cites the volume as II instead of IV. Issues of multidisciplinary versus interdisciplinary research are also elucidated and the issue of collaborative efforts (successes and failures) between physical scientists and archaeologists are also related.

"Compositional Analysis in American Archaeology" by Maria Nieves Zedeño, Daniela Triadan, and Ronald L. Bishop (pp. 27-55, 9 figs., 1 table). This paper traces the history of instrumental neutron activation analysis (INAA), compositional analysis and archaeological inference, and the integration of scientific archaeology and materials science. Following a brief discussion of the structure and function of distribution networks, the authors turn to North American characterizations with general examples drawn from obsidian and ceramics. Specific examples of White Mountain Red Ware from the American

Southwest and Homul-Naranjo ceramics from the Maya region of Mesoamerica are detailed; the authors also emphasize the need for the close collaboration between field and laboratory specialists. "Problems and Methods: A Critical Retrospective on Some Past Source Characterization Studies" by Philip L. Kohl (pp. 57-73). The implications of XRD studies undertaken on chlorite and steatite (soft stone) vessels and the INAA characterization of obsidian from the Caucasus of Southwest Asia are considered for materials dating to the 3rd and 2nd millennia BCE. Multiple raw material sources and multiple production centers are discussed and Kohl notes that both characterization studies yielded new, sometimes unexpected, results which "demanded further historical interpretation and explanation." "Databases for the Analysis of European Ceramics in American Archaeology" by Jacqueline S. Olin, M. James Blackman, and Gregory Waselkov (pp. 65-78, 3 figs., 1 table). The authors discuss studies on Spanish and Spanish-Colonial tin-lead glazed ceramics (majolica) and French tin-lead glazed ceramics (faience) in examining the role of compositional studies in the typological classification of European ceramics recovered from American archaeological sites. The reliance upon typological classification in drawing conclusions about Mexican majolica production (particularly in Puebla, Mexico) and Sevilla-produced majolicas are noted, and materials from St. Catherines Island, Georgia, are reviewed. Data on faience ceramics from French colonial Louisiane (Old Mobile, Alabama) are also reported. Majolica production centers were limited in comparison with the multiple locations of faience manufacture. The authors' emphasize the need for collaborative work between archaeologists and materials scientists.

"Five Decades of Maya Fine Orange Ceramic Investigation by INAA" by Ronald L. Bishop (pp. 81-91, 5 figs., 3 tables). INAA and interdisciplinary studies on this important thin walled ware and Fine Gray pottery are reviewed and the results of an analysis of 1,150 specimens (ca. 690-770 CE) from the Palenque, Mexico region are reported. Upstream and downstream distinctions in compositional groups along the Usumacinta River are documented. Bishop comments that it is essential to maintain high analytical precision, to obtain large data sets, and seek both uni- and multivariate relationships. He also reminds us that compositional data do not tell us where the pottery was manufactured, how it was moved [distributed] after being made, or the meaning of the ceramic's compositional similarity to other pottery. "More than Methodology: INAA and Classic Maya Painted Ceramics" by Dorie Reents-Budet and Ronald L. Bishop (pp. 93-106, 12 figs.). The authors review the type:variety system (and its five levels of abstraction) that are traditionally used in the analysis of Maya ceramics, especially pictorial pottery. The reasons for the lack of success in revealing specific spatial dimensions are documented, and George Koehler's (1979) four-part stylistic analysis of Maya ceramics is related to compositional analytical data from Tikal, Guatemala. The addition of art historical stylistic categories of investigation to the archaeological type:variety analytical method, the authors argue, allows for a more complete extension of ceramic units into prehistoric cultural reality. "The Dish-Plate Tradition at Palenque: Continuity and Change" by Robert L. Rands and Ronald L. Bishop (pp. 109-132, 13 figs., 5 tables, 7

endnotes). Maya dish-plates from Palenque are examined in relation to technostylistic variation, and early petrographic and more recent INAA data are reviewed. Heavily weathered pottery proved to be a challenge in discerning temporal changes in 267 specimens, but the authors argue that substantial chronological ordering of paste compositions can be discerned and that the type-variety method is of little use. The clay sources, an expanding population, and sample sizes are also considered.

"Modern Measures of Traditional Hopi Pottery: Physical and Behavioral Sources of Variation in Hopi Pottery Production and Exchange, A.D. 1300-2000" by Veletta Canouts and Ronald L. Bishop (pp. 135-155, 9 figs, 2 tables). Sikyatki polychromes (14th-16th centuries) in the American Southwest (primarily from Awatovi sites) are the focus of an interdisciplinary study that included INAA. Loci of and conditions of production are elaborated for Sikyatki polychromes, 17th century San Bernardino ceramics, 18th century Payupka polychromes, and 20th century Hano polychromes (Sikyatki revival ware). The evolution of polychrome ceramics is a portion of Hopi social history but raises questions about classification devised by E. Charles Adams (1979) and Harold Colton (1956). The authors view ceramic change as the result of complex relationships between resource acquisition, ceramic manufacture, and subsequent distribution and use rather than perceiving ceramic change as direct reactions to cultural events such as foreign interference. "Local Production, Non-Local Production, and Distribution: Usulután and Usulután-Like Negative Painted Ceramics in Nicaragua" by Frederick W. Lange, Erin L. Sears, Ronald L. Bishop, and Silvia Salvado González (pp. 157-171, 6 figs., 1 table). "Usulután" (defined by Lothrop in 1927) refers to a specific ware produced 600 BCE-CE 300 in areas of Lower Central America. The authors distinguish regional uses of the term (Usulután, Usulután-like, Usulután technique) and focus on recent archaeological data obtained from the Managua and Granada areas of Nicaragua. Compositional, technical and spatial data on Usulután-like pottery is reviewed. Results indicate that the El Mirador site imported Usulután ceramics from the highland home region and also "produced locally a negative-painted ceramic that was similar in appearance to the imported resist-painted pottery." Ulua-Yojoa pottery is also report. The present data raises a series of major questions about the number of production areas and regions, chronological and developmental patterns, changes in manufacturing technologies, and technology transfer.

"Chemical Characterization of Clay Sealings from Arslantepe" by M. James Blackman (pp. 173-182, 2 figs., 6 tables). Samples from 123 clay sealings (representing five "categories" [types]) excavated from two rooms in the 4th millennium BCE central Turkish site of Arslantepe were analyzed by INAA. Three major and two minor chemical composition groups are documented; the three larger groups appear to have been selected for use on different types of closures, related to the degree of plasticity needed to seal successfully the container. Clayey marl, distinct from the locally available alluvial clays, was preferred. "Total Variation as a Measure of Variability in Chemical Data Sets" by Jaume Buxida i Garriós and Vassilis Kilikoglou (pp. 185-198, 7 figs., 2 tables). The authors (from the University of Barcelona and Laboratory

of Archaeometry, NCSR Demokritos, Athens, respectively) present four case studies from the Iberian Peninsula which use XRF analysis of ceramics: Can Peixau (a Roman period kiln near Barcleona), Abella (a Hispanic Terra Sigillata production site in northeast Spain), Clunia (a Roman town in north central Spain), and Balearic Island cooking pots. Other specimens analyzed by XRF came from Crete: Kommos (a kiln from Late Minoan IA levels), Neogene clays, and specimens from Poros (Late Minoan III) and Eleusis (Middle Bronze Age). The authors report that total variation as a quantitative measure provides a tool for the direct comparison of variability among different case studies; the importance of a statistically significant number of specimens is emphasized. Sources of variability within a compositional data set can be highlighted through elementary logratio variance values for each element determined. "Supplementing Bulk Chemistry in Archaeological Ceramic Provenance Investigations" by Hector Neff, James W. Cogswell, and Louis M. Ross, Jr. (pp. 201-224, 19 figs.). The confounding roles of paste preparation and weathering in INAA are reviewed. The authors focus on their use of EDS, WDS, and SEM in an effort to differentiate the causes of patterning in bulk INAA data. Data on calcareous fabrics from Late Roman Cyprus, Late through Terminal Formative Fine Red pottery from Guatemala, and Late Formative Sacatepequez White Paste ceramics from Guatemala are analyzed.

"Localized Production or Trade? Advances in the Study of Cobalt Blue and Islamic Glasses in the Levant and Europe" by Julian Henderson (pp. 227-245, 8 figs.). The author (Department of Archaeology, University of Nottingham, UK) traces briefly the history of the chemical analysis of ancient glass since the 1950s and notes the seminal work by Sayre and Robert Brill (Corning Glass Museum), before turning to a more detailed account of the chemical analysis of Islamic glass. Specimens from an 8th-9th century 'Abbasid glass factory at al-Raqqqa, Syria are detailed, and the chapter focuses on five types of glass composition (1, 2, 3, 4, 4a - reflecting magnesia and alumina variances) and compares these with 9th to 10th century Nishapur, Iran materials. He also considers Islamic and European cobalt blue glass and potential source, and suggests that the most likely source of cobalt was Anatolia. "Middle Horizon Bronze: Centers and Outliers" by Heather Lechtman (pp. 248-268, 26 figs., 3 tables). The Wari and Tiwanaku cultures dominated the Andean region during the Middle Horizon, 600-1000 CE. Lechtman provides background materials and assesses ores and bronze alloys from the major archaeological sites of Pikillacta (arsenic bronze) and Tiwanaku (ternary Cu-As-Ni bronze and tin bronze) as well as sites in the Moquegua Valley (colonies of the two cultures). Data from the outlier colonial sites of Cerro Baúl and Omo is also presented. She writes that "the horizon character of metallurgy throughout the Andean culture period we have been considering lies in the far-flung exchange of ideas and technological experience across political, cultural, and topographic boundaries that stimulated the manufacture of a variety of bronzes in an uncommonly mineral-rich environment." "Production of Silver in Antiquity: Ore Types Identified Based upon Elemental Compositions of Ancient Silver Artifacts" by Pieter Meyers

(pp. 271-288, 4 figs., 6 tables). This contribution considers the manufacture of silver objects beginning in the thirds and fourth millennia BCE in Southwest Asia, Greece, and Egypt. A commonly accepted premise is that silver metallurgy developed from lead smelting technology. Meyers focuses on the elemental composition of silver in pre-Islamic coins and other objects from the region, observing that there were systematic changes in average gold content of silver artifacts that can be documented chronologically and geographically. He proposes technological transformations that account for these modifications and presents a model of silver technology moving from galena to cerussite to the use of silver ores. "Geological Implications of the Lead Isotope Data on Ores from the Great Orme Mine, North Wales, U.K." by Emile C. Joel, Joan J. Taylor, and Robert D. Vocke (pp. 291-311, 9 figs., 1 table). This Bronze Age mine, located on the north coast of Wales, is a uniquely managed vertical and horizontal system that reached depths of 70 m and has 8 km of tunnels. XRF defined the general range of elements present in artifacts and ores, and lead isotope data provided specific reliable characterizations that were treated by multivariate and probability statistics. Random sampling was seen as unsatisfactory and potentially misleading. The authors conclude that "lead isotopes can be used to characterize the geological ores known to be of archaeological significance in a specific time or context and sometimes define the geological zones from which the ores were extracted."

In sum, two papers provide historical context, eleven focus on ceramics: two on the American Southwest, two on Iberia and the Mediterranean, one on Old and New World specimens, and four on Mesoamerica (predominantly the Maya). In addition, one contribution emphasizes glass and another considers silver from Southwest Asia, and two center on bronze metallurgy (the Andes and Wales). In this festschrift the reader is exposed to studies undertaken using INAA and XRF and treated to a variety of issues, such as sample sizes, and various analytical methods that employ elemental variance, principal components plots, Q-mode factor plots probability of scaling, and total variation, among others. Although edited by Lambertus van Zelst, the former head of the SCMRE, the fine and steady hand of Ron Bishop is seen the editing and production of this splendid compendium. This remarkable volume honors a remarkable man.

Alex Gibson (editor), **Prehistoric Pottery: People, Pattern, and Purpose**, Prehistoric Ceramics Research Group, Occasional Publication No. 4, British Archaeological Reports International Series S1156, Archaeopress, Oxford, UK, 2003. xii + 226 pp., 146 illustrations (one in color), 28 tables, 6 appendices, ISBN 1-84171-526-3, \$87.00, £37.00 (paper). Alex Gibson (BA, Ph.D., FSA, FSA (Scot), MIFA) is Reader in British Prehistory, Department of Archaeological Sciences, University of Bradford, Bradford BD7 1DP, UK, A.M.Gibson1@Bradford.ac.uk. His special interests are the Neolithic and Bronze Age, earlier prehistoric ceramics, timber circles, palisaded enclosures, and Neolithic and Bronze Age settlements. Active in the Prehistoric Ceramics Research Group, he is also the co-author of *Prehistoric Pottery for the Archaeologist* (Alex Gibson and Ann Woods, Leicester:

Leicester University Press, 2nd edition 1997, 203 pp., 239 illustrations. This well-known reference work is a concise introduction to prehistoric ceramics that summarizes the development of pottery studies (typological and scientific), and examines prehistoric ceramic technology in the light of the results of the authors' experiments and ethnographic observations and those of other investigators. The British ceramic sequence from 3000 BCE to CE 400 is described briefly, but the majority of the volume consists of a glossary of pottery styles and terms relating to pottery manufacture. The second edition includes new research, radiocarbon dating, and an updated bibliography.

Prehistoric Pottery: People, Pattern, and Purpose is a collection of conference papers assembled and edited by Gibson that consists of his introductory essay and 13 chapters; each chapter has its own bibliography. In "Prehistoric pottery: People, pattern and purpose: Some observations, questions and speculations" (pp. v-xii, 13 figs.), Gibson notes that these papers derive from an October 2002 conference organized by the Prehistoric Ceramics Research Group and the Ceramic Petrology Group, and held at the University of Bradford. Nearly 30 papers were presented and there were about 60 conference attendees. He further explains the emphases on patterns, purpose, and people, and reports that the conference was successful for a number of reasons. These included social networking and information sharing, varying and complimentary presentations by researchers working in diverse regions, a "holistic or elevated" view of material culture, the mixture of archaeology and archaeological science, and the international mix of delegates. I shall next summarize the contents of each chapter and then offer some general comments.

The initial chapter was by Clive Jonathan Bond and entitled "The coming of earlier Neolithic pottery and people in the Somerset levels" (pp. 1-27, 13 figs., 3 tables). Neolithic ceramic assemblages excavated by the Somerset Levels Project are reinterpreted. The purposeful deposition of and evidence of discard are considered, and the assemblage is related to materials from Sweet Track, Burtle Bridge, and other loci in the Brue Valley of central Somerset during the first part of the fourth millennium BCE. Recalibrated radiocarbon dates are presented and other artifacts (lithics and wood) are also discussed. Attention is drawn to the role of pottery production, exchange, and purposeful discard in wet landscapes (such as a peat bog); the concepts of domestic activity as inferred by pottery distribution are also questioned. Estelle Bougard presented "Ceramic in the Upper Paleolithic" (pp. 29-34, 6 figs.). The author reviews the status of research on ceramic manufacture during the Upper Paleolithic (ca. 40,000-10,000 years BP) from the Old World, and uses the term "pottery" to connote only utilitarian containers made of fired clay. This examination considers pottery from Japan (Pre-Jomon and Incipient Jomon sites), China (the site of Jianxi), and Siberia (Kapova Cave), and terracotta figurines of animals or humans from Europe (Dolní Věstonice, Moravia; Pavlov, Czech Republic; and other sites), Siberia, and North Africa.

Louise D. Brown and Carl Heron wrote "Boiling oil: The potential role of ceramics in recognizing direct evidence for the exploitation of fish" (pp. 35-41, 5 figs.). The authors examine

the characterization of fish oils present in unglazed ceramics with particular reference to archaeological pottery from the site of Old Scatness, Shetland. Ethnographic sources document that small fish (sillocks and pillocks) were used in the production of oil used for domestic purposes and exported. Specimens from sherds were studied by gas chromatography (GC) and gas chromatography/mass spectrometry (GC/MS). Other evidence suggests that the same fish were exploited during the Middle Iron Age. Brown and Heron also outline a basic procedure for detecting fish products through the residue analysis of ancient ceramics. In "The use of pottery in Dutch Hunebedden" (pp. 43-51, 3 figs.), A. L. Brindley discusses hunebedden, simple, long rectangular megalithic chambers that had an entryway in one long side and internal space varying from 6 to 40+ square meters. Beads made of stone, bone, jet, and amber, flint tools and occasional cooper ornaments were recovered from the chambers but the primary artifacts are pottery dated in seven phases from 3400 to 2850 BCE. The assemblages of TRB pottery were deposited over long periods and include numerous fragmentary vessels and a number of distinctive vessel forms (tureens, wide and shallow bowls, drinking flasks and beakers, pedestaled bowls, and small cups). The vessel types, sizes, and their decorations are used to relatively date the hunebedden. The domestic rather than ritual nature of the pottery suggests the vessels were used in periodic feasting that accompanied burial rituals.

Gilles Durrenmath focused on "Continuity and change in the late Neolithic in southern France: A technological point of view" (pp. 53-64, 7 figs.). Analyses of clays and tempers as a part of the chaîne opératoire are reported for Middle and Late Neolithic pottery obtained from production areas in Provence, France. The definition of the range of temper processing treatments leads to technological and cultural comparisons. The cultural comparisons demonstrate the differentiation power of measurements which give particular quantitative modality for each studied cultural group; principal components analysis plays a role in this research. Hence, this examination reveals signs of diachronic continuity in technical practices. The hypothesis of a relationship between the transformation of temper treatments and the dispersal of metallurgy is also examined.

Louise A. Ford and Eric C. De Sena's contribution was "Proto-Common Ware: Defining a ceramic tradition in Pompeii" (pp. 65-70, 4 figs.). Excavations in the House of the Vestals (Regio 6, Inula 1) undertaken by the University of Bradford's "Anglo-American Project in Pompeii" revealed a substantial assemblage of pottery dating from the Italian Iron Age to CE 79. A key question involves a local versus a regional production of these ceramic vessels. The authors point out that there is substantive literature on late Hellenistic and Roman period Common Wares in Italy but there has been little research on the variety of pottery that bridges the Iron Age Impasto pottery and the later Common Wares (8th to 3rd centuries BCE). This pottery, termed "Proto-Common Ware" includes domestic and votive forms, especially bowls and jars. An analysis of 83 diagnostic sherds is reported and the authors also demonstrate the significance of the study of prehistoric medium-coarse wares from Pompeii which assists in understanding the evolution of

Pompeii from a small indigenous settlement to a major Samnite-Roman city.

Annette Hancocks wrote “Little Paxton pottery” (pp. 71-110, 17 figs, 10 tables, 5 appendices). A total of 3,835 sherds dating to the Iron Age and Transitional period (ca. 400 BCE to CE 60) obtained from the Little Paxton site located northeast of Bedford were reanalyzed using the BUFAU pottery recording system and Prehistoric Ceramics Research Group (PCRG) guidelines (1997). The new study resulted in the identification of four ceramic phases: Neolithic/Bronze Age, Middle Iron Age (400-100 BCE), Late Iron Age (Handmade) (100 BCE-CE 43), and Late Iron Age/Transitional (CE 44-60). Vessel shapes, temper, and decorative characteristics are described. The petrological analysis was undertaken by David Williams. Hancocks also discusses settlements, society, chronology, and evidence for trade contacts, and she concludes that the Little Paxton assemblage follows the Nene Valley tradition. Next, David Knight, Patrick Marsden, and John Carney presented “Local or non-local? Prehistoric granodiorite-tempered pottery in the East Midlands” (pp. 111-125, 5 figs., 1 table). The petrological examination of prehistoric pottery from sites in the East Midlands revealed a range of highly distinctive fabrics characterized by angular granitoid temper which may derive from the igneous 4 km sq Mountsorrel granodiorite outcrop located on the eastern edge of Charnwood Forest. The results suggest that pottery producing centers may be located within or close to the area and tend to verify a regional exchange system proposed by Alan Vince and David Williams for granodiorite-tempered Anglo-Saxon pottery. The authors provide production and distribution evidence, and outline a methodology for additional petrological and chemical analysis (thin section and inductively-coupled plasma emission spectroscopy [ICPMS]) designed to test the hypothesis of non-local production. The preferential selection of specific clays is also suggested. Ann Macsween wrote “The pottery from Minehowe, Orkney: Aspects of contextual interpretations” (pp. 127-134, 8 figs.). An underground chamber at Minehowe, Tankerness, Orkney, five miles east of Kirkwall was the focus of geophysical survey and excavation in 2000. Four trench excavations produced 7,000 sherds, the preliminary analysis of which assists in understanding the nature of associated ditch deposits. Data on fabrics and surface finish is presented, and there is a discussion of temporal sequences.

Malgorzata Daszkiewicz and Michael Meyer’s presentation was entitled “New pots of new people” – Archaeoceramological study of La Tène and “Przeworsk”-like pottery in the Celtic German highland zone” (pp. 135-146, 23 figs., 3 tables [Fig. 10.4 in color]). At ca. 50 BCE, the oppidia-oriented “Celtic” system collapsed and those settlements that remained in the German highlands changed to a subsistence economy. However, prior to this dramatic cultural change, new pottery types related to the south Polish Przeworsk culture began to appear among the local ceramics and at the time of the collapse displaced local ceramics, hence, these changes are seen as a population change. The results of the chemical (WD-XRF) and mineralogical analysis (thin section) of 410 sherds and seven specimens of loam are presented. Refiring by Matrix Group Refiring (MGR) indicated an original

firing temperature of 700-800° C. The color figure depicts specimens before and after the refiring. The results of geochemical, petrographic, and refiring experiments on the Przeworsk pottery, however, point strongly to a continuation of traditional techniques and the use of the same raw materials as in earlier times, and the authors argue against a complete population replacement. M. Pilar Prieto-Martínez, Isabel Cobas-Fernández, and Felipe Criado-Boado wrote “Patterns of spatial regularity in Late Prehistoric material culture styles of the NW Iberian Peninsula” (pp. 147-187, 23 figs., 8 tables). The authors examine the relationships between archaeological material culture and social landscapes in prehistoric societies, and argue that it is possible to discern and define regularities in ceramic style (especially decorative styles) and the social strategies used to construct the cultural landscape. The hypothesis is founded on the principle that both phenomena are expressed throughout spatial forms whose organization was determined by the codes for representing space that existed within a given sociocultural order. Early, Mid, and Late Neolithic; Bronze Age; and Iron Age I, II, and Late ceramic styles are characterized.

Maria Roumpou, Carl Heron, Stelios Andreou, and Kostas Kotsakis prepared “Organic residues in storage vessels from the Toumba Thessalonikis” (pp. 189-199, 5 figs, 3 tables). Toumba Thessalonikis is a Bronze Age settlement located in central Macedonia dating to the 12th century BCE. Excavations revealed a central building with several rooms where large pithoi (storage vessels) were found in abundance. Sherds from 14 pithoi were analyzed using gas chromatography/mass spectrometry (GC/MS). The analysis confirmed the presence of waxy residues and the presence of alcohols, alkanes, free fatty acids, and wax esters. The significance of the results and the archaeological implications are considered. The data suggest the utilization of beeswax as an interior vessel coating in order to decrease permeability. Lastly, Alison Sheridan’s chapter was “New dates for Scottish Bronze Age cinerary urns: Results from the National Museums of Scotland Dating Cremated Bones Project” (pp. 201-226, 14 figs., 1 appendix). The author discusses the rational and initial results of this NMS project, supported by the Society of Antiquaries of Scotland, on dating human cremated bones from Scottish prehistoric sites. To date, the project has focused on “urned and un-urned cremations” dated to the Bronze Age. The following urn vessel forms are considered: Vase, Collared, Cordon, and Bucket. Radiocarbon dates and a revised urn chronology are presented and local and regional urn variants are documented.

This is a very valuable contribution to a growing ceramic literature focusing on Great Britain and the Continent. The organization of the conference and its general results are reminiscent of the annual Ceramic Ecology symposia held at the American Anthropological Association’s annual meetings (chaired by Charles C. Kolb), now in its 18th year, which has expanded the concepts developed by Frederick R. Matson in his edited volume *Ceramics and Man* (New York: Wenner-Gren Foundation for Anthropological Research; Chicago: Aldine, 1965). There is also an emphasis on “patterns, purpose, and people,” and these symposia have been successful for the same reason Gibson cites. Matson stated that “unless ceramic studies lead to a better understanding of the cultural context in

which ceramic materials were made and used, they form a sterile record of limited worth.” Ceramic Ecology as a methodological and theoretical approach has as its paramount goal a better understanding of the peoples who made and used pottery and seeks to redefine our comprehension about the significance of these materials in human societies. The concept of is contextual, multi- and interdisciplinary, and analytical. On the one hand, it seeks to evaluate data derived from the application of physicochemical methods and techniques borrowed from the physical sciences within an ecological and sociocultural frame of reference. It also relates environmental parameters, raw materials, technological choices and abilities, and sociocultural variables to the manufacture, distribution, and use of pottery and other ceramic artifacts. On the other hand, interpretation of these data and explanations of the ceramic materials utilize methods and paradigms derived from the social sciences, humanities, and the arts.

One can see a parallel in Alex Gibson’s *Prehistoric Pottery: People, Pattern, and Purpose*. Scholars based in North America will agree with Gibson that there remains new and dynamic activity in the study of prehistoric pottery – and we would add historic, ethnographic, and contemporary art pottery to that mix as well. A few minor typographical errors have crept into the texts (especially the abstracts) and Table 13 (p. 196) should be Table 12.3. This volume may be purchased from Archaeopress (Gordon House, 276 Banbury Road, Oxford OX2 7ED England; telephone and fax +44 (0) 1865 311914, or e-mail: bar@archaeopress.com) and from The David Brown Book Co. (P.O. Box 511 [28 Main Street], Oakville, CT 06779; telephone toll-free: 800/791-9354, 860/945-9329, fax: 860/945-9468, or e-mail david.brown.bk.co@snet.net). The Internet site listing all BAR volumes is at <http://www.archaeopress.com/defaultBar.asp>

Test Tubes and Trowels: Using Science in Archaeology by Kevin Andrews and Roger Doonan (Stroud, Gloucester, UK: Tempus Publishing Ltd, 2003, 160 pp., ISBN 0-7524-2918-3, £17.99 paperback). The authors, both with the Department of Conservation Sciences, University of Bournemouth, have prepared a basic volume designed for undergraduate students and the general public. This slim volume focuses on European concepts and examples, and has a preface and seven chapters, accompanied by 75 excellent illustrations, and supplemented by “Suggested Reading” (p. 157), containing 28 entries. Among these are Cumberpatch and Blinkhorn’s edited volume, *Not So Much a Pot, More of a Way of Life: Current Approaches to Artefact Analysis in Archaeology* (1997); Henderson’s *The Science and Archaeology of Materials* (2001); Hodder’s *Reading the Past: Current Approaches to Interpretation in Archaeology* (1991); Johnson’s *Archaeological Theory: An Introduction* (1999) [reviewed on H-NET <http://www.h-net.msu.edu/reviews/showrev.cgi?path=23486982861612>]; Peacock’s *Pottery in the Roman World: An Ethnoarchaeological Approach* (1982); Pollard and Heron’s *Archaeological Chemistry* (1996); and Taylor and Aitkin’s edited work, *Chronometric Dating in Archaeology* (1997) [reviewed on H-NET <http://www.h-net.msu.edu/reviews/showrev.cgi?path=6306898705074>].

There is a comprehensive index of topics and proper nouns

(pp. 158-160) with four columns per page; however, some of the pagination is incorrect for entries on ceramics and pottery (for example, pp. 105-117 should be pp. 106-113), a frustrating inconvenience. The subjects covered are wide ranging and there is no in-depth treatment of ceramics or physicochemical methods. In spite of its limitations, *Scientific Analysis of Archaeological Ceramics: A Handbook of Resources* by Kathleen Barclay (Oxford: Published for English Heritage by Oxbow Books, 2001), which was reviewed in *La Tinaja: Newsletter of Archaeological Ceramics* 14(1):11-13 (Summer), is preferable, but the venerable source, *Pottery Analysis: A Sourcebook* by Prudence M. Rice (Chicago: University of Chicago Press, 1987) remains authoritative but a bit dated for ceramic studies. Nonetheless, Andrews and Doonan cover a number of significant topics in materials science and archaeometry but at a superficial level. A brief review of the seven chapters follows.

“Chapter 1: Understanding the Relationship” (pp. 8-24) relates the nature of archaeology and archaeological science and the development of archaeometry. The concept of agency is introduced (pp. 14-15) and the authors consider the history of archaeological science and theory (referring to David Clarke, Clive Gamble and Thomas Kuhn) and the “conflict” of science and art (mentioning Pollard and Heron 1996). In “Chapter 2: Identity and Power” (pp. 25-40) the authors consider social identity, problems of scale, analyses of power, and specialization. There is a case study, “Forging Identity in the Manx Iron Age” (pp. 35-49), which is based upon T. Darvill’s *Billowen Neolithic Landscape Project, Isle of Man* (Conservation Research Report 7, Bournemouth University, 2000). Atomic Absorption Spectrometry [AAS], Reflected Light Microscopy, and SEM-EDS [Scanning Electron Microscopy- Energy Dispersive X-ray Spectroscopy] are reviewed briefly. Ceramics are mentioned (p. 25-27) and the principles of thin section petrography outlined.

Andrews and Doonan’s Chapter 3: “Organising Production” (pp. 50-75) references models of production, noting Peacock (1982) and van der Leeuw (the citation is lacking), redefines mode of production and provides two case studies. The first, “The Enigma of the Eastern Alpine Metallurgical Process” (pp. 53-63) considers changes in furnace architecture, and the second, “Slip-decorated Pottery in Iron Age France” (pp. 63-75) while the second reviews X-Ray Diffraction Analysis [XRD] and provides a rather useful production sequence model. Ceramics are considered (pp. 50-52, 63-75), and the second case study, based upon John Collis’s Auvergne Archaeological Survey, makes use of a combination of XRD, SEM-EDS, thin section analysis, and ceramic refiring experiments. “Chapter 4: Craft and Culture” (pp. 76-98) is a convoluted presentation that includes discussions of ideas about action, seeing beyond the obvious (using Hawkes’s “Ladder of Inference”), the concept of culture and how to study it, and the “cult of culture.” Grog-tempered ceramics are mentioned (pp. 76-77). A case study, “Neolithic Pottery on the Isle of Man” (pp. 87-98), derives from Darvill’s research at the Billown Quarry and mentions X-radiography and SEM-EDS analyses. The authors conclude that “the consideration of the earthfast jar bibliography, supported by archaeological evidence, archaeometric analysis,

ethnographic parallel and theoretical consideration of style and symbol, has allowed us to approach these enigmatic vessels with a possible understanding of how they were made and used in the Manx Late Neolithic" (p. 98).

In "Chapter 5: Searching for Provenance" (pp. 99-122) the authors review the history of provenance (differentiating traditional and analytical approaches and early studies), emphasize Lead Isotope analysis, ceramic thin section studies, and Trace Element Analysis [TEA]. They also consider transformative and non-transformative raw materials, assumptions and problems associated with analyses (mentioning ceramics, pp. 106-113), and mention ICP-AES [Inductively Coupled Plasma-Atomic Emission Spectroscopy]. The chapter concludes with a case study on provenancing metals in the Aegean metals by Lead Isotope Analysis (pp.113-122). "Chapter 6: Exploring Change" (pp. 123-142) reviews concepts of chronology, dating, and "change," and provides a historical assessment before discussing relative and absolute dating methods. Techniques are rather briefly reviewed (pp. 130-134): radiogenic noble gas techniques (Potassium Argon [K-Ar] and Uranium Helium [U-He], radioactive equilibrium/disequilibrium, radiogenic/cosmogenic nucleotide [C-14], particle trace [U-238]), radiation dosimetry, and chemical reaction [Obsidian Hydration Dating]. Radiocarbon dating receives a fuller treatment, while the case study relates concepts of agency, scientific dating techniques and chronology building (pp. 138-142). Moldmade Samian Roman tableware is mentioned as an example (pp. 129-130). Lastly, in "Chapter 7: Redefining the Relationship" (pp. 143-156), the authors review analytical pedigrees, the "heroes of technology," how the world "really" is, sampling, redefining disciplinary relationships, arenas of practice, and political implications. They note that "the chaîne opératoire is about understanding choice. Perhaps it is these reason [sic.] scientists have avoided studying technology in this way, because it does sound rather complex and messy" (p. 153). There are no ceramic examples in this chapter.

Andrews and Doonan conclude that "throughout this book we have stressed the role of technological choice amongst other issues such as spatial articulation with respect to investigating archaeological theses and escaping from technological deterministic arguments or interpretations that celebrate the evolving and increasing efficiencies if technologies" (p. 153). In this regard, the authors have succeeded in presenting an appropriate overview. The authors note that the application of sophisticated archaeological techniques to ill-conceived archaeological questions is detrimental, and through the case studies they document the uses and abuses of science. While a useful general introduction, this volume is not recommended for pedagogy or serious scholarship.

A review of John N. Miksic's edited volume *Earthenware in Southeast Asia: Proceedings of the Singapore Symposium on Premodern Southeast Asian Earthenwares*, Singapore: Singapore University Press, National University of Singapore, published with the assistance of the Southeast Asian Ceramic Society, will appear in this column in the next issue of the SAS Bulletin.

New Publications

Southeast Asian Ceramic Museum Newsletter. The inaugural four-page issue 1(1) of this first-class publication was published electronically in September 2004. There are well-written and informative materials, and splendid color illustrations throughout, including an article on Burmese celadon kilns that is especially noteworthy. The issue also has a book review format with "extra" images that is a real plus, and News Briefs that are enlightening. The publication of the Newsletter coincides with an announcement of the presence of the Southeast Asian Ceramics Museum on the Rangsit campus of Bangkok University, scheduled to open in early 2005 according to Dr. Roxanna M. Brown, the Museum's Director. The second issue 1(2) published in October 2004 has separate articles on the Klang Aow II and the Hoi An II? shipwrecks, an article on Ming ceramics at the Freer, and images of displays in the museum. Newsletter subscriptions may be obtained by contacting the museum at museumnewsletter@bu.ac.th

British Archaeological Reports continues to publish significant monographs, many of which concern ceramics. All BAR volumes are listed on the Internet at <http://www.archaeopress.com/defaultBar.asp> Among the new works on pottery and ceramics are:

- Bettles, Elizabeth A. (2003). **Phoenician Amphora Production and Distribution in the Southern Levant.** British Archaeological Reports International Series S1183. Archaeopress, Oxford, UK.
- Cantu Ontiveros, Miguel Angel (2003). **Cerámica tardorromana de cocina de las Islas Baleares.** British Archaeological Reports International Series S1182. Archaeopress, Oxford, UK.
- De Micheli Sculthess, Christiane M. A. (2003). **Aspects of Roman Pottery in Canton Ticino (Switzerland).** British Archaeological Reports International Series S1129. Archaeopress, Oxford, UK.
- Ikäheimo, Janne P. (2003). **Late Roman African Cookware of the Palatine East Excavations, Rome: A Holistic Approach.** British Archaeological Reports International Series S1143. Archaeopress, Oxford, UK.
- Phelps, Bill (2004). **The Neolithic Pottery Sequence in Southern Greece.** British Archaeological Reports International Series S1259. Archaeopress, Oxford, UK. Phelps posted a 12-item "Errata" (typographic and date errors in the bibliography) on the Aegeanet listserv (3 October 2004); it is also available directly from him at phelps@hol.gr
- Jung, Jr., S. Paul, edited by David A. Higgins. (2003). **Pollocks of Manchester: Three Generations of Clay Tobacco Pipemakers. The Archaeology of the Clay Tobacco Pipe XVII.** British Archaeological Reports 352. Archaeopress, Oxford, UK.

Other Publications

Ceramic Ethnoarchaeology: "Domestic Spaces as Public Places: An Ethnoarchaeological Case Study of Houses, Gender, and Politics in the Ecuadorian Amazon" by Brenda J. Bowser and John Q. Patton (Department of Anthropology, Washington State University, Pullman, Washington), *Journal of Archaeological Method and Theory* 11(2):157-181 (June 2004). In Special Issue: Recent Advances in the Archaeology

of Place, Part II (Special Editor, Brenda J. Bowser). Abstract: "In an ethnoarchaeological case study, we take a gendered perspective on the house as a locus of political life in Conambo, a village of about 200 Achuar- and Quichua-speaking peoples in the Ecuadorian Amazon. In this small-scale society, women and men engage actively in political practice in independent yet complementary ways, and the domestic context is a place where political life is conducted on a daily basis. In this article, the house is examined as a politicized context at three scales of materiality: the organization of settlement in the community, the spatial relationships in the house, and the scale of painted designs on pottery bowls used in the house. At each scale, we identify material correlates of women's and men's participation. Our goal is to bring attention to potential archaeological correlates of women's political involvement in past societies, to question assumptions about women's political lives and domestic spaces, and to expand the ways in which anthropological archaeology may contribute to understanding cross-cultural variation in women's and men's domains of power."

Hyperfine Interactions: One volume of two volumes on **Hyperfine Interactions** concerning "Mössbauer Spectroscopy in Archaeology" was mentioned in the last *SAS Bulletin*. Over the past few years Ursel Wagner (Physik-Department E15 TU-Muenchen, 85747 Garching, Germany; e-mail: uwagner@ph.tum.de and urwagner@gmx.de; Internet site <http://www.archaeometry.de>) as guest editor has been compiling two special issues of **Hyperfine Interactions on Mössbauer Spectroscopy in Archaeology**. The issues also include articles on complementary methods which she and her colleagues have been applying in order to interpret Mössbauer data. Wagner reports that a set of the two volumes may be ordered by individual customers for \$46.00 UC cy by sending an e-mail to: Kirsten.Theunissen@springer-sbm.com

Previous Meetings

National Archaeological Congress, Argentine Symposium: Archaeometrical Studies in Archaeological Ceramics was held 20-25 September 2004 at the Museo Etnográfico, Buenos Aires. Additional information is available from Norma R. Ratto, nratto@ciudad.com.ar.

The Midwest Archaeological Conference and Southeastern Archaeological Conference (MAC/SEAC) held a joint meeting in St. Louis, Missouri, 20-23 October 2004. (Oct. 20-23 2004). John Kelly (Washington University, St. Louis) and Timothy E. Baumann (University of Missouri, St. Louis) were the conference organizers. Two of 22 symposia were devoted to ceramics. Symposium 1: "Recent Contributions to the Application of Ceramic Method and Theory in the Archaeology of the Midwest and Southeastern U.S. - Part 1" was chaired by Ann S. Cordell and J. Herbert. Twelve papers were given by: J. Herbert; Patrick Livingood; Ann S. Cordell and Patrick Livingood; Michael S. Smith and J. Herbert; Theresa McReynolds and J. Herbert; Vicki L. Rolland; Evan Peacock; Lee Tippet, and Eric Voigt; Shannon Koerner; Chris Espenshade; Amy Marquardt; and James Waggoner. The discussant was Vincas P. Steponaitis. Symposium 4: "Recent Contributions to the Application of Ceramic Method and Theory in the Archaeology of the Midwest and Southeastern U.S. -

Part 2" was chaired by Ann S. Cordell and J. Herbert. The 12 presentations were by R. Steven Kidd; Keith H. Ashley and Vicki Rolland; Colleen Delaney-Rivera; Robert C. Dunnell; Rita Fields; Stevan C. Pullins; Neill J. Wallis; Timothy L. Bober; Heather Howdeshell; John Richards; James Wettstaed; and Janet Ford. Prudence Rice served as the discussant. Additional information on the conference is available on the Internet at <http://www.southeasternarchaeology.org/2004seac.html>; the titles of the presentations are not available online.

Prehistoric Pottery: Recent Research is the subject of The Prehistoric Ceramics Research Group and The Prehistoric Society Joint Conference scheduled for 22-24 October 2004 at the University of Bradford. The guest speaker was Dean E. Arnold, Professor of Anthropology, Wheaton College (Wheaton, Illinois), who presented "Changes in Production Organization and Pottery Technology in a Maya Community 1965-1997." For additional information, contact Alex Gibson, Hon. Chairman, Prehistoric Ceramics Research Group, Department of Archaeological Sciences, University of Bradford, Bradford, BD7 1DP (Telephone: ++ 44 (0)1274 235385, e-mail: A.M.Gibson1@Bradford.ac.uk) and see the Internet site at <http://www.brad.ac.uk/acad/archsci/depart/conferen/prehistsoc04/>.

The American Society for Ethnohistory held its annual meeting 27-31 October 2004 in Chicago. Among the 202 papers presented was "Broken Sherds and Faded Papers: The Importance of Material and Historical Records in the Interpretation of the Past" by Elizabeth M. Scott (Illinois State University), one of six presentations in the session "The Material Record: Archaeology as an Alternative," organized by Rob Mann (Louisiana State University) and Robbie Ethridge (University of Mississippi).

Microscopy in Archaeology: Current Research and New Directions was a one-day symposium held on 3 November 2004 at Oxford University, Begbroke Science Park, Yarnton. The meeting is organized by the Royal Microscopical Society (RMS) in association with The Institute of Physics Materials and Characterisation Group and Oxford Materials Characterisation Service (OMCS). The organizers are Alison Crossley, Peter Northover and Chris Salter (OMCS). There will be oral and poster presentations; the abstract deadline was 6 September 2004. The organizers report that "Microscopy is one of archaeology's most important servants in post-excavation studies, and even during excavation, from entomology to sedimentology by way of metallurgy and many other scientific disciplines. This role has meant that microscopy has followed the other sciences and archaeology has not always taken advantage of innovations in microscopy. The meeting is designed to provide an insight into best current practice and promising new developments. It will also take a very broad view of archaeology, from prehistory to industrial archaeology." The international program includes: Kilian Anheuser (Musée d'Art et d'Histoire, Geneva) on applications of low voltage and variable pressure SEMs; Mark Robinson (University Museum, Oxford) on the optical microscope in environmental archaeology; Thilo Rehren (Institute of Archaeology, UCL) on Raman microscopy of inclusions in early platinum to understand the technology; Kathy Eremin (National Museums

of Scotland) on microscopy of early photographs in the SEM - results and problems; Peter Northover (Oxford Materials Characterisation Service) will talk about bronze surfaces and the preservation of archaeological detail; and Russell Wanhill (National Aerospace Laboratory NLR, Amsterdam) will present EBSD applications to archaeological metalwork, especially on the Gundestrup cauldron. There will also be presentations on the state of the art in surface profiling and on new developments in optical microscopy for archaeology. This meeting will be of interest to any one in archaeology who regularly uses a microscope, and to microscopists looking for a window on a new world. Further details are available on the Internet at http://www.rms.org.uk/cgi-bin/events_details.cgi?id=mic35825626 or from Lucy Haworth tel: 01865 248768, FAX: 01865 791237; e-mail lucy@rms.org.uk.

ESAF-OAS Joint Meeting: The Eastern States Archaeological Federation's 71st Annual Meeting and the Ontario Archaeological Society's 31st Symposium were jointly held 4-7 November 2004 in Midland, Ontario. The meeting had the theme "Journey to the Land of the Huron" at which 33 papers were presented. Among these were six that were oriented to ceramics: Tony Wonderly, "Effigy Pipes of Jefferson County, New York: Diplomacy and Myth in the Eastern Iroquois Region"; Nick Gromoff, "Patterns among the Pots: Ceramic Vessels from the Ball Site (BdGv-3)" and Katie Hull, "Beyond the Mean Ceramic Date: The Interpretive Potential of Historic Ceramics"; Alicia Hawkins, "Could Wendat Potters Have Produced Frilled Pottery in Huronia? An Examination of Microvariation in Pottery Decoration"; Holly Martelle, "Some Thoughts on the Impact of Epidemic Disease and European Contact on Ceramic Production in 17th C. Huronia"; and Jenneth Curtis, "The Origin and Development of Castellations in Ontario." Additional information is available from the Ontario Archaeological Society oasociety@bellnet.ca

The Ceramic Petrology Group met on 25 November 2004 at the British Museum, London. The theme of the meeting was "Ceramic and Stone Petrography: Related Sources of Evidence." Additional information is available from Caroline Cartwright, Department of Conservation, Documentation & Science, ccartwright@thebritishmuseum.com

Internet Resources

The CSA Newsletter (Volume XVII, No. 2), edited by the Center for the Study of Architecture/Archaeology's Harrison (Nick) Eiteljorg, II, was posted on the Internet in late September 2004 and is available at <http://csanet.org/newsletter/#fall04>. Included in this issue is a particularly interesting article by Susan C. Jones "Archaeological Data Presentation Formats on the Web" in which she demonstrates that minor variations can lead to some unexpected differences; see <http://csanet.org/newsletter/fall04/nlf0402.html>

Journal for the Intercultural and Interdisciplinary Archaeology (JIIA.it), Pubblicazione periodica telematica scientifica, ad accesso gratuito, non-profit, di archeologia, scienze dell'antichità e scienze applicate all'archeologia, began electronic publication in September 2003; see <http://www.jiia.it/> Articles thus far published are in Italian, French, or English. The second issue for December 2003 has five contributions on

ceramics; see http://www.jiia.it/Jiia.it/Sezione_II/Jiia_02/Indice_Jiia_02p3.html. The following provides the names of the authors and institutional affiliations, the article titles, and published abstracts.

Valery Rigby (British Museum) "Classifying Roman pottery in Britain: The National Roman Fabric Reference Collection." [Abstract: M/02] The absence of a standardised terminology for Roman pottery fabrics had long concerned researchers in Britain. In the post-war period, as archaeological research expanded, separate reference collections were established by excavation units, university departments and museums using whichever methodology appeared best to meet their individual requirements for recording and publishing results. While the need for some method of collating the disparate collections into a national framework was apparent, the absence of funds and an institutional infrastructure for research and curatorial support prevented the organisation of such a project. Finally, in 1992, backed by funding from English Heritage, these were in place so Roberta Tomber and John Dore could begin. Thanks to the cooperation of numerous colleagues and institutions the project was successfully completed with the publication in 1998 of *The National Roman Fabric Reference Collection: A Handbook*. Clearly stated in the Handbook, the aim of the NFRFC is to provide a standard for the identification and description of Roman imports and the most common and widely distributed Roman-British products which are likely therefore to feature in most localised reference collections. At present, it consists of a physical reference collection of 193 typical sherds and a library of the thin-sections used during the project, available for study at the British Museum, London. The publication combines a consistent and standardised description with a X2 colour print of a fresh break. The full documentary archive is available on-line. Besides providing a method to ensure overall consistency in fabric identification, the classification allows for future expansion and a tool for researchers. Hopefully it will also reduce the amount of repetitious fabric descriptions in publications.

Robin P. Symonds (Museum of London) "Is there an Atlantic phenomenon? The evidence of the Roman pottery." [Abstract: N/02] The author of this paper has been engaged in the study of Roman pottery since the late 1970's in Britain and western Europe, and also, more recently, in eastern Europe. In 1997 he was invited to be the principal London participant in the Caesar Project, a European Commission project in which the Roman pottery from sites at Irun, in Gipuzkoa, at Bordeaux and at London was compared and the methodologies for recording those assemblages were harmonised. In the process of assisting Arkeolan to establish a 'London-style' system for recording the pottery from Irun, it became clear that such a system could be adapted rather more easily than might have been expected to an assemblage found so far from Britain. This paper is a reflection on why that adaptation may have worked so easily, and on the nature of Roman pottery assemblages across the Empire. It focuses in particular on quantitative analysis of pottery assemblages, and whether or not such an approach may lead to a better understanding of culture. The underlying question which arises from comparative analysis of assemblages must be: do similarities in pottery groups

and in types present within groups represent shared culture? If the answer is yes, can that shared culture be defined geographically, and if so, where are the limits of something which might be defined as an "Atlantic pottery culture". While stressing the fact that the evidence for such a culture is at present very thin, the paper looks at ways in which we might test the hypothesis, and thus define the culture. It also suggests that one way to begin to the test may be to look at more distant assemblages (and pots) in other parts of the Roman Empire, in order to define first what is universally Roman, and thereafter to separate from that elements which may more properly be called 'regionally Roman', in terms of both very large regions and smaller, more distinct regions. Technological possibilities or limitations may also play a significant role in the development of "pottery cultures", as may the demands of military or ritual uses of particular pottery types, and such cultures may also become more or less clearly defined over time. At present there is serious lack of data which might be used to define or dismiss the idea of an Atlantic pottery culture, but already there are plenty of clues, and this paper suggests that when the appropriate data becomes increasingly available, the answer will perforce emerge.

Thierry Martin (Université de Toulouse) "Le commerce atlantique des céramiques sigillées de montans sous le Haut Empire." [Abstract: O/02] Parmi les ateliers de sigillée de la Gaule romaine, Montans est, sans nul doute, celui qui a le plus largement profité du commerce maritime organisé le long de l'arc atlantique au cours des deux premiers siècles de notre ère. Il est désormais bien établi en effet que les productions de la grande manufacture tarnaise, après avoir descendu le Tarn et la Garonne, étaient exportées par voie maritime à partir du port de Bordeaux, d'une part vers le Sud, en direction des côtes cantabriques et asturiennes, d'autre part vers le Nord, le long du littoral atlantique, en direction de l'estuaire ligérien, de l'Armorique et de la Bretagne romaine. Cette étude se propose de faire le point sur cette diffusion, dont les débuts se placent à la fin du règne d'Auguste et qui s'est prolongée jusque sous le règne d'Antonin le Pieux. Après avoir rappelé le rôle déterminant joué par le port de Bordeaux dans le commerce atlantique des sigillives montanaises, identifiées, le long de l'arc atlantique, les principaux ports et comptoirs maritimes liés à leur diffusion, on examinera, dans le détail, les données archéologiques actuelles qui permettent d'apprécier, à sa juste mesure, l'importance de leur rayonnement atlantique. On montrera, en particulier, comment, de Tibère à Néron, les productions montanaises ont été abondamment diffusées le long des côtes de la Mer Cantabrique, où elles ont très souvent concurrencé les sigillées de la Graufesenque arrivées jusqu'à par la voie de l'Ebre. On signalera également leur présence plus que soutenue sur nombre de castros asturiens de même qu'au cœur de la Galice romaine. On n'oubliera pas non plus d'indiquer comment, à la fin du règne de Néron, les sigillées montanaises cesseront rapidement d'être acheminées sur les marches du Nord-Ouest de la péninsule Ibérique, du fait de la concurrence imposée alors par les productions hispaniques de Tritium Magallum et de sa région. Nous ferons enfin une large place à l'étude de leur commercialisation, durant la première moitié du IIe s. ap., en direction de la Britannia et des camps

du Mur d'Antonin.

Marinella Pasquinucci and Simonetta Menchelli (Università degli Studi di Pisa), "La diffusione delle sigillate pisane nell'area atlantica." [Abstract: P/02] Si presentano dati relativi alla distribuzione del vasellame in terra sigillata pisana nelle province atlantiche (Lusitania, Aquitania, Gallia Lugdunensis, Gallia Bellica, Germania Inferior, Britannia) dove questo materiale risulta presente con alti indici di presenza dall'età augustea alla seconda metà del I sec. d.C. Ci si propone di delineare i flussi commerciali ed i meccanismi economici in cui il vasellame pisano era coinvolto; in particolare si focalizza l'attenzione sui rapporti intercorrenti tra forniture militari e mercato civile.

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Late Medieval Pottery Webpage: LMT Kiln Wasters: Sue Anderson (Finds & Post-excavation Manager, Suffolk CC Archaeological Service, Shire Hall, Bury St. Edmunds IP33 2AR, UK, sue.anderson@et.suffolkcc.gov.uk) reports on wasters from kilns in Weybread, Suffolk, at <http://www.suffolkcc.gov.uk/e-and-t/archaeology/lmtpot.htm> "The assemblage seems to be a single batch and consists almost entirely of jugs, with a few [?] residual sherds of other vessel types. Unfortunately there was no planning condition on the site, but the owners notified us when they found a large pit full of pottery in their conservatory footing trench. The parish (Weybread) has known kiln sites of 15th/16th century date and it is likely that an undiscovered kiln lies not far from this new find. The LMT industry on the Norfolk/Suffolk border produced pottery which appears to have been consumed largely by the people of Norwich. However, it is now being recognized at more sites in Suffolk, and whilst Norwich may have been the main market, it was clearly being used in other parts of this region."

Foundation for the Advancement of Mesoamerican Studies, Inc.: Arturo Rene Muñoz has published additional material on the ceramics of Piedras Negras, Guatemala. (2002) Ceramics at Piedras Negras, Guatemala. Report to the Foundation for the Advancement of Mesoamerican Studies, Inc., Crystal River, FL. <http://www.famsi.org/reports/00079es/index.html>; traducido del Inglés por Alex Lomónaco (2004) Las Cerámicas de Piedras Negras, Guatemala. <http://www.famsi.org/reports/00079/index.html>; and (2003) The Ceramic Sequence of Piedras Negras, Guatemala: Type and Varieties. Report to the Foundation for the Advancement of Mesoamerican Studies, Inc., Crystal River, FL. <http://www.famsi.org/reports/02055/index.html>

The excavation report of the Tepeaca Kiln Project by Ronald A. Castanzo is available on the website of the Foundation for the Advancement of Mesoamerican Studies, Inc. (FAMSI).

The Tepeaca Kiln Project is concerned with the evolution of pottery production and distribution and the processing of lime in the central highlands of México. From 1994-1998, the Acatzingo-Tepeaca Project (PAT) found evidence of dense Prehispanic settlement in the central Puebla-Tlaxcala Basin, including the remains of hundreds of ancient kilns. The Tepeaca Kiln Project is focused broadly on the investigation of these features and has three major objectives: (1) locating the features discovered by PAT and determining whether or not they represent ancient kilns, (2) ascertaining the function of the kilns, and (3) characterizing the level of organization (household vs. non-household) and the degree of craft specialization associated with the use of the kilns. In the summer of 2003, the project concentrated on a 3.2 km² area to the north of the town of Tepeaca, in which a total of 86 kilns were located, most believed to date to pre-Contact times. Both kilns believed to have been associated with ceramic production and kilns that apparently functioned in lime processing were found in the survey. Three lime kilns were excavated, one of which dates to the early Middle Formative Period, another to the early 20th century; to date, radiocarbon dating has not been conducted on material from the third excavated kiln. Although speculative at this time, low intensity production representing at best a part-time level of specialization is suggested by the available data for Middle Formative lime processing. The report is available on the Internet at <http://www.famsi.org/reports/02021/index.html>

The Archaeologist's Field Handbook by Heather Burke and Claire Smith (St. Leonards, NSW, Australia: Allen & Unwin, ISBN 1865088625, 432 pp., 40 halftones, 25 tables, 100 charts/line drawings, 2004) is due to be published in September; see http://www.allenandunwin.com/arch_handbook/home.asp. It contains a useful chart, "Rim-base diameter chart for nineteenth century ceramics," that is also available on the Internet at http://www.allenandunwin.com/arch_handbook/RimDiameter.pdf. The handbook is designed to take into the field and its endpapers have been designed with relevant measurement scales so that next time you need to photograph an artifact, you can fold back the covers of the book (printed in cream to minimize reflective glare) and use them. Allen & Unwin Australia (P.O. Box 8500, St. Leonards, 1590, NSW, Australia) may be contacted online at academic@allenandunwin.com

Internet Archaeology 16 includes an article by Christine Longworth entitled "Buckley Sgraffito: A Study of a 17th Century Pottery Industry in North Wales, Its Production Techniques and Design Influences", available at http://intarch.ac.uk/journal/issue16/longworth_toc.html. The author reports that the area around Buckley in north Wales has been associated with the production of pottery since the 13th or 14th centuries. Nineteen different pottery sites have been identified, producing a wide range of ceramic wares in the six-hundred year period up to the mid-20th century. In the 17th and 18th centuries, many of the wares produced were of high quality, on a par with Staffordshire wares of the same date. During the early 17th century, the technique of sgraffito decoration spread to north Devon and Somerset from mainland Europe. Buckley is the only known site to produce early sgraffito wares in northern Britain. The article aims to establish the

date of the production and range of early sgraffito wares and to examine the derivation of the designs and illustrations on the vessels. An illustrated catalogue has been produced and a comparative study made of sgraffito wares elsewhere to place Buckley into a national and international context. The results show that early sgraffito production at Brookhill pottery, Buckley, was between 1640 and 1720. Of the excavated pieces (all dishes), 62% were made from 1640- 80, and the number of sherds by vessel number is also greater within that date range. The form and designs on the remainder of the sherds, dated up to 1720, are no different from those dated to 1640-1680, which suggests a continuous period of production.

Miscellaneous News

"The Ming & Mac Gaps: Asian Trade in Chinese and Vietnamese Ceramics from 1380-1580" was the title of a lecture given at the UCLA's Center for Southeast Asian Studies on 7 October 2004 by Roxanna M. Brown, who received her doctorate (major in art history and minor in Southeast Asian general history) from the University of California, Los Angeles (UCLA) in January 2004. Her dissertation was *The Ming Gap and Shipwreck Ceramics in Southeast Asia*. Brown is Director of the Southeast Asian Ceramics Museum, which was recently established at the Rangsit campus of Bangkok University, and known for her book *The Ceramics of South-East Asia, Their Dating and Identification*, 2nd ed. (2000). The term 'Ming gap' was introduced by Tom Harrisson in 1958 in reference to Sarawak River delta sites that offered an abundance of Song dynasty ceramics but none that could be assigned to the Ming dynasty. Over time it came to refer informally to the unproven idea that no Chinese blue and white ceramic ware was exported to Southeast Asia for most of the 15th century. A series of shipwrecks excavated since 1974 provided new evidence on Asian trade and ceramics in the 15th century. Her talk explained three aspects of the Ming gap: first, a near absence of the particular blue and white Chinese ceramics for more than a century (c.1352-1487); second, a drop in all Chinese ceramic exports from 100% to 30-50% in the early Ming years (c.1368-1424/30), and third, a further drop to only 1-5% immediately following the Zheng He voyages. The Mac gap (in reference to the Mac dynasty of Vietnam) is a characteristic of the 16th century. After massive exports in the decades of about 1470-1510, Vietnamese ceramics abruptly disappeared from shipwrecks sometime about 1510-1520. The talk was illustrated with trade ceramics from ten shipwrecks that cover the period circa 1380-1580.

Without comment: From the Indo-Asian News Service: "Ancient pottery found in China." Lanzhou (China), September 12, 2004 (IANS) Archaeologists have discovered four painted clay balls in Gansu province, which they believe ancient man used as a hunting weapon some 3,000 years ago. The balls, 2-4 cm in diameter, were painted red, yellow and black, Xinhua reports. "These ceramic balls, in their shapes, sizes and weights, are very suitable for people to hurl by hand or with a rope," said Wang Donghai, deputy head of the provincial institute of coloured pottery in Gansu. "They must be efficient in hunting fast running animals," he said, adding that the hollow ceramic balls would make sounds during the movement.



Book Reviews

Mark Hall, Associate Editor

Cultivated Landscapes of Native North America. W. E. Doolittle, Oxford University Press: Oxford/New York, 2000. 600 pp., 83 halftones, 63 line illus, and index. Price: \$55.00. ISBN 0199250715 (paperback).

Reviewed by Minkoo Kim, Department of Anthropology, University of California at Berkeley

This book was written as a part of a trilogy, the other two titles being *Cultivated Landscapes of Native Amazonia* and *the Andes* by William M. Denevan, and *Cultivated Landscapes of Middle America on the Eve of Conquest* by Thomas M. Whitmore and B. L. Turner II. This volume represents one of the most comprehensive syntheses of written documents about North American agricultural fields before European contact. According to the author's own estimate, almost half of the works on aboriginal agriculture in North America are cited in the book. Doolittle drew on three types of sources: 1) documentary accounts by early explorers, missionaries, and administrators; 2) 19th and 20th century ethnographic documents; and 3) reports from archaeological investigations. The volume is useful, most of all, as a reference book for professionals whose research interests include agriculture of indigenous peoples. It provides comprehensive information on forms, functions, and locations of native fields, names and characteristics of cultivated plants, and recommended sources for additional reading.

The book is essentially a geographical study, but should have appeal to scholars in other disciplines. Having a background in archaeology, with interests in people-plant relationships among hunter-gatherers, landscape modifications, and prehistoric agricultural activities, I found this book engaging. This book contains useful data sets for these and other subjects of archaeological interest, but a few theoretical and methodological standpoints of the author need to be highlighted in order to further stimulate archaeological discussions of the book.

The four main sections of the book, spread over eleven chapters, are connected by a straightforward unifying theme that is not be completely new to archaeologists and geographers: namely, that landscapes of North America before European immigration were far from a pristine environment that had been little disturbed by people. Whether they were agriculturalists or not, aboriginal peoples developed various techniques for extracting resources from surrounding environments, and through these efforts, significantly modified natural landscapes into cultural landscapes. Thus, the theme renders it similar to other archaeological studies in which human impact on the environment and the creation of cultural landscapes is major concerns.

The book also explores a topic commonly addressed by archaeological investigations: a broad transitional stage between gathering of wild plants and agriculture of domesticated species. Three chapters in Part II will certainly attract many archaeologists for this reason. Chapters 2 and 3 are dedicated to the protection, encouragement, and cultivation of herbaceous and woody plants by native peoples, and Chapter 4 to gardening practices. For my own purposes, Part II was useful in that it provides a concise introductory discussion of traits associated with different stages of plant husbandry, and detailed information on names of wild plants, methods of plant husbandry, and reference documents.

One thing that should be noted, however, is that the author's use of the term 'landscape' differs significantly from the way it is currently used in archaeology. The author traces his concept of landscape to the Berkeley school of geography in the early 20th century, and exclusively emphasizes visually perceptible material phenomena at the expense of cultural implications. Accordingly, the study focuses primarily on visual reconstruction of agricultural fields through the use of written and excavated materials, and on understanding morphological characteristics of these fields under various climatic and geological conditions. As the author explicitly says in his introduction, the interest of this book does not lie in investigating demographic, social, economic, or political implications of native agricultural fields. In this regard, the concept of landscape used in this volume is certainly different from the way it is conceived by archaeological schools, particularly the systemic approach (Rossignol 1992), historical ecology (Crumley 1994; Kirch and Hunt 1997), and phenomenology (Bender 1992; Bender et al. 1997).

The fact that the book is a geographical study, along with author's rather limited definition of the term landscape, certainly establishes an orientation that distances it somewhat from the theoretical perspectives usually encountered in contemporary archaeological studies. From the outset, the author clearly states that geography involves 'understanding systemic relationships between certain elements rather than synthesizing data' (p. 5). Among the elements that are seen as determining the morphological characteristics of native fields are included amount of moisture, length of frost-free or growing season, soil fertility, and types of plants. Again, the cultural elements that archaeologists usually consider, such as the causal relationships between agricultural practices and demography, social complexity, and/or cultural contacts between groups, are not addressed in any detail. Rather, the author suggests that the amount of moisture is the most important factor influencing agricultural practices and morphological characteristics of the fields, thus landscapes of cultivation.

Accordingly, the organization of Parts III to V is based on climatic conditions, especially the amount of moisture for growth and development of plants. The chapters within each of these sections are related to secondary climatic conditions, such as temperature (Part III), or agricultural methods to address these conditions (Part IV and V). Part III presents rainfed agriculture, which depends on precipitation falling directly on fields. The rainfed agriculture is considered the most basic form of agriculture and uses simple agricultural tools, such as stone hoes and spades, which mostly relate to short-term landscape

modifications. Examples of landscape modifications through this form of agriculture include weeding and mounding, field preparation through slashing and burning, and "corn hills" (Chapter 5). Ridged fields in the Upper Midwest and Great Lakes serve as another example of rainfed agriculture, in which an artificially elevated planting surface offsets the problems imposed by low temperature (Chapter 6).

Part IV covers methods of applying moisture in arid environments, and Part V removing it in wet environments. In order to practice agriculture even with a paucity of moisture, native people used sandy soil with high water storage capacity (Chapter 7), constructed artificial features impeding overland flow of water (Chapter 8), altered drainage systems and water distribution (Chapter 9), and/or used formal canals (Chapter 10). At the other end of spectrum, problems imposed by abundance of water were solved through cultivation of hydrophytic crops, cultivation on seasonally inundated surfaces (Chapter 11), and excavation of drainage ditches and levees (Chapter 12). Some methods permanently modify landscapes and are thus archaeologically identifiable, as photographs and schematic drawings well illustrate throughout these chapters.

To conclude, *Cultivated Landscapes of Native North America* is full of information and has potential to attract many readers in the field of archaeology. Readers may feel overwhelmed by lengthy and detailed descriptions of agricultural strategies and landscape modifications, and the author's intentional ignorance of the cultural implications of cultivated landscapes will not reverberate among archaeologists. To my knowledge, however, this volume represents the most comprehensive synthesis of literature currently available on native field systems in North America. As any archaeologist is well aware, archaeological material represents only a fragment of what once existed, and it is subject to various misinterpretations. Archaeologists will find the documentary, ethnographic, and archaeological evidence presented in the book to be useful and effective aids to visualizing the types of plants involved in human activities, specific methods of cultivation, and their locations. The comprehensive bibliography and index can also direct readers to original reference materials depending on their research interests.

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Tepe Gawra: The Evolution of a Small Prehistoric Center in Northern Iraq. Mitchell S. Rothmann, with an Appendix by Brian Peasnell, University Museum Monographs 112, University of Pennsylvania Museum of Archaeology and Anthropology: Philadelphia, 2002. xxii + 403 pp., 135 figures, 31 tables, 84 plates, 1 appendix, index. Price: \$ 75.00 (cloth). ISBN: 0924171898 (alk. paper).

Reviewed by Meredith S. Chesson, Department of Anthropology, University of Notre Dame, Notre Dame, IN 46556 USA

Over the last century anthropologists have devoted a tremendous amount of time, effort and resources to exploring the many pathways to power in the rise of state-level society. Mesopotamia has consistently played a starring role in this endeavor. Rothmann's reanalysis of the Late Chalcolithic occupational levels at Tepe Gawra offers an important addition to the anthropological corpus on the nature of social, economic, and political complexity in the past. In this volume Rothmann presents an updated and expanded version of his dissertation, analyzing the Late Chalcolithic community of Tepe Gawra in northern Iraq on the eve of the Uruk Expansion and the development of state-level society. This study exemplifies the research trend identified by Stein (1998) in focusing on local histories to reflect on regional developments in social, economic, religious and political complexity. While the chiefdom and state paradigm provides a foundation for Rothmann's analysis, he concentrates on the development of complexity within Gawra as an avenue for considering broader regional issues, such as the Uruk Expansion and the development of the state.

In reviewing Rothmann's volume, one immediately recognizes the immense challenge he faced in organizing and interpreting data collected and documented by seventy-year old excavation methodologies and field recording techniques. For instance, data collection and field recording varied from year to year in terms of quality based on the field director for each of the six seasons. Tepe Gawra was originally excavated in the early 1930's under the direction of Ephraim Speiser, sponsored by the University Museum at the University of Pennsylvania and the Baghdad School of the American School for Oriental Research (ASOR). Speiser directed two seasons of excavations, and was succeeded as field director by Charles Bache for three field seasons; in the sixth field season, Speiser returned as field director. In outlining the nature of the recording systems and excavation methodology, Rothmann concisely and clearly presents the limitations on analysis based on varying collection and documentary methodologies employed by the directors, their field crews, and catalogers. Furthermore, the collected materials found their ways to multiple locations, including Baghdad, where much of the collection may have been lost, damaged or destroyed by the recent Gulf War.

Rothmann's volume focuses on two goals: (1) to present the data, stratigraphy, and finds in as complete a way as possible; and (2) to interpret the Late Chalcolithic occupation within the greater regional questions of the Uruk Expansion, increasing complexity and the development of state level society. Without question, this volume fulfills both of these goals admirably. In

fact, he has framed the presentation of the data in terms of his second goal, providing the reader with an exhaustive but very readable account of the excavation results. Thematically, he has concentrated on addressing several questions with the Gawra data, all related to the broad question of increasing social, political and economic complexity. Within a broadly-defined evolutionary framework, Rothmann seeks to understand the nature of complexity and leadership in the Gawra community, and how these shift through time. Within this general line of inquiry, Rothmann uses the Gawra data to explore the nature of specialization and administrative centralization of craft production within the community and in its relations with neighboring sites. Based on an extraordinary reconstruction of excavation notes, he conducts a room-by-room, level by level, analysis of activity areas across the site, and presents this information in a series of plans and explanatory passages that demonstrate the nature of economic activities in the community through time. Based on this analysis he explores how life at Gawra can offer insights into the foundation of Mesopotamian state-level society, and successfully investigates Gawra's economic role in the greater regional economies.

The volume is well-organized and divided into six chapters and an appendix. The first chapter introduces the goals of volume, the updated chronology (based on a School of American Research advanced seminar (Rothmann 2001), theoretical questions, local environment and resources, contemporary sites and settlement patterns, demographic trends in the region, organizational changes in the region (tied into questions of social, political, and economic complexity), and models for regional exchange and interaction. The second chapter presents the history of excavation, the nature of database with its particular weaknesses and strengths. The third chapter presents Rothmann's analysis of site stratigraphy, architectural plans by phase/level, and ceramic chronology. The fourth chapter outlines the methodology Rothmann employed to analyze functional activities across space in Gawra. The fifth chapter contains presents all of the data from each of the levels, and represents the bulk of the volume. He has organized the description of data for each level into thematic questions, systematically reviewing the Gawra materials in terms of function, change, and organization of the site through time and across space. In this level by level, structure by structure analysis he presents data framed by the following thematic questions: functional size/evolutionary trends in function and organization in the site, population size, external relations (evidence for exchange), and administration (particularly the degree of centralization). In the sixth chapter he brings all of the data together into the overarching question of complexity and the rise of the state in Mesopotamia, outlining Gawra's contributions to understanding the evolutionary development of complexity in chiefdom and state-level societies. Finally, the Appendix, authored by Brian Peasall, provides an impressive presentation of the data from mortuary contexts at the site through time. His mortuary analysis concentrates on analyzing the relative ages, grave types and associated grave goods for the mortuary remains across space and through time at Gawra. Like Rothmann, he faces serious challenges in the recording of the burials in terms of their phasing, the ages of the individuals

(without the luxury of a physical anthropologist's analysis, but rather based on a field assessment of relative size of the skeleton), and the recording of associated grave goods.

The volume is very well organized, well illustrated and presents a systematic reanalysis of the nature of complexity in a prehistoric context. Despite the considerable challenges offered by the nature of the database, Rothmann successfully analyzed the data from Gawra to offer a case study of increasing complexity in a pre-state community. The presentation of the settlement and the mortuary data is clear and easy to follow, and the use of graphics to illustrate the distribution of activity areas across the community enables the reader to follow Rothmann's storyline of increasing and shifting patterns of complexity. It is Rothmann's storyline, often relying on classic dichotomies of public/private, open/closed and on rigid categories for functional activities (for example, labels of temple, domicile, defensive structure, storeroom, workshop), that sometimes limits the power of his analysis. In his exhaustive discussion of artifacts and functional activities throughout all of the structures for each of the levels, he notes that quite often more "public" or "administrative" objects co-occur with more "private" or "household" objects. It seems at times that the need to label a space as public or private or public undercuts his arguments for increasing complexity, since it is clear from his analysis that these dichotomies may not be as useful in understanding where people do certain things. Based on his evidence from Gawra, I would think that conceptualizing function and activities on a continuum of more private or more public, or more or less administered, may be a more helpful model for understanding how social and economic production is organized through time in this community. In fitting the data to a more traditional model of organization, Rothmann may have missed an opportunity to present a more nuanced analysis to understanding increasing complexity because his analysis often glosses over crucial connections between peoples' social, economic, and political behaviors in differing pathways to power, prestige, and authority. Peasall's appendix on mortuary data is also framed by the overall question of increasing social, economic, and political power. While the presentation of the mortuary data is well-organized and excellent overall, his contribution would have been strengthened by more recent theoretical discussions of analyzing mortuary practices as an avenue for exploring social complexity. For both Rothmann's and Peasall's analysis, however, the issues I raise here demonstrate the contribution of the volume to encouraging more questioning and exploration of this data and these questions.

To conclude, Tepe Gawra is an excellent study of increasing social, economic, and political complexity demonstrating the diverse pathways to power in a single community. Rothmann succeeds in fulfilling his goals for the volume, and offers to students and researchers a well-written, well-organized, nicely illustrated, and clearly conceptualized case study. Moreover, this volume demonstrates the power and potential of revisiting long-curated and unpublished materials to address the same questions that many current field researchers are pursuing. In an age when archaeologists are actively exploring options for heritage management, this volume emphasizes the importance of analyzing materials already excavated and awaiting analysis,

despite their age and the nature of collection, recording, and curation methods. Overall, this volume will appeal to a broad audience of readers, including students of Near Eastern history and archaeology, as well as other archaeologists working in New and Old World contexts interested in exploring the nature of increasing social complexity.

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Multiple Approaches to the Study of Bifacial Technologies. Edited by Marie Soressi and Harold L. Dibble, University of Pennsylvania Museum of Archaeology and Anthropology: Philadelphia, 2003. xiv+290 pp., 113 figures, 42 tables, index. Price \$59.95. ISBN: 1931707421

Reviewed by Sarah Milliken, Department of Archaeology, University College Cork, Republic of Ireland

This book is based on the proceedings of a symposium held in Philadelphia during the 2000 meeting of the Society for American Archaeology. In the Preface the editors state that the aim of the volume is to provide the first comprehensive overview of bifacial technology. The fourteen papers cover a vast chronological and geographical span, from the earliest Acheulian in the Old World to the Late Woodland and Mississippian in the New World. In this review I will first highlight the salient points in each paper, before discussing the merits of the volume as a whole. The papers are not reviewed in the vaguely chronological order in which they appear in the volume; rather, on the basis of their content, I have rearranged them into what are, to my mind, more logical groups.

Acheulian in Africa and India

The first paper in the volume, by Schick and Clark (pp. 1-30), discusses technological development and variability of hand-axes and cleavers in the Acheulian industrial complex in the Middle Awash region of the Afar Rift, Ethiopia. The evidence from the Middle Awash provides the longest and most complete sequence of Acheulian industries from any African region, spanning the later Lower Pleistocene to the later Middle Pleistocene, and thus represents an invaluable record of early hominid adaptive patterns. Each stage has been found to be technologically and typologically distinct, with clear patterns of variability evident in assemblage composition, in the technological, morphological and typological characteristics of the bifaces, and in the geological and environmental contexts of the sites. This inter-assemblage variability is interpreted in terms of the behavioural activities and group composition of

the tool-makers, while often remarkably strong intra-assemblage uniformity in stylistic and technological conventions of biface manufacture suggest the operation of strong rules or conventions in technological operations.

Noll and Petraglia (pp. 31-53) use primary data to systematically compare Acheulian assemblages from Olorgesailie, Kenya, and the Hungsi-Baichbal Valleys, India, in order to explore general characteristics of biface morphology and hominid raw material exploitation patterns. Bifaces from both regions were found to overlap in size and shape attributes, though the hominids targeted specific raw material outcrops, which led to some variations in biface parameters. While certain assemblages showed evidence for rejuvenation, the level of curation, transport and reduction of was found to be negligible. Noll and Petraglia conclude that the Olorgesailie and Hungsi-Baichbal biface assemblages display similarities with respect to hominid raw material exploitation patterns, biface manufacturing strategies and transport behaviours.

Handaxe shape and mental constructs

Two distinct forms of Palaeolithic hand-axe, pointed and ovate, were first recognised by Evans (1860), and were subsequently given metrical and statistical validity by Roe (1968). Since then there has been considerable debate over the reasons why these distinct forms should occur, most recently between McPherron (1995, 1999, 2000) on the one hand and White (1995, 1998) on the other. The debate continues in this volume, with papers from both camps offering contrasting views.

McPherron (pp. 55-75) argues that the shape of a handaxe is a function of the degree to which it has been reduced, or resharpened, with pointed forms occurring early in the reduction sequence, and ovate forms later on. They are therefore all part of a single bifacial reduction strategy, and there was no deliberate intention to produce either pointed or ovate forms. Having first tested his 'reduction model' on the British and northern French hand-axe data (McPherron 1995, 1999), in this volume he broadens his geographical scope and applies it to the morphological variability within several stratigraphic units from Tabun Cave, Israel.

Ashton and White (pp. 109-123) present a review of recent interpretations of hand-axe and assemblage variation in the British Lower Palaeolithic, and in particular of McPherron's reduction model and White's own raw material model. These models are further tested by analysing stages in the knapping process through the identification of hand-axe roughouts and hand-axe refitting groups, and it is argued that raw materials explain a major part of the morphological variation in hand-axes, and that this can be identified on a very localised scale. They illustrate this by examining the neighbouring sites of Barnham and Elveden, Suffolk, where the smaller scale variation that can be recognised might reflect differences in knapping tradition and, on occasion, the idiosyncrasies of individual knappers. Ashton and White conclude that handaxe production was guided by a 'mental construct', consisting of a series of parameters relating to function and methods of production, and that it is the optimisation of these parameters that results in the production of ovate handaxes.

Middle Palaeolithic bifaces

Doronichev and Golovanova (pp. 77-107) examine bifacial tools in the Lower and Middle Palaeolithic of the Caucasus. In the Upper Acheulian the assemblages are dominated by partial handaxes, often made on flakes, especially in the Transcaucasus, while sites in the northern Caucasus have Lower Palaeolithic industries with few or no hand-axes. In contrast, the Middle Palaeolithic sites in the northwestern Caucasus are characterised by a wide spectrum of bifacial and partial bifacial tools, while these are very rare in the Transcaucasus. Doronichev and Golovanova interpret their findings as indicating that different cultural groups inhabited the northern Caucasus and Transcaucasus during the Lower and Middle Palaeolithic.

Soressi and Hays (pp. 125-147) present the results of a case study from the Périgord region of France on the manufacture, transport and use of Mousterian hand-axes which, they point out, tend to be relatively neglected compared with Acheulian handaxes due to the current focus on Levallois debitage in Middle Palaeolithic industries. Based on an analysis of raw material sources, technology and use-wear of nineteen hand-axes from Grotte XVI, which dates to approximately 65,000 years ago, Soressi and Hays conclude that there is strong evidence to suggest that these Mousterian hand-axes were carefully designed and maintained implements that were transported from one location to another.

Leaf points and convergence

Kozłowski's paper (pp. 149-162) is concerned with leaf points in Europe, which he argues, appear in a number of unrelated industries and are not part of a developmental continuum from Acheulian handaxes. Indeed, the oldest leaf point industries are found in Lower Palaeolithic Levallois industries, outside the distribution range of the Acheulian, while in the Middle Palaeolithic leaf points have been found in both the east-central European Micoquian and in the Mousterian-Levalloisian industries of southeastern Europe. The Micoquian bifacial tradition continued into 'transitional' industries (Altmuhlian, Szeletian, Streletskian and Jerzmanowician), which evolved in the fully-fledged Upper Palaeolithic, whereas the Mousterian leaf point tradition vanished at the end of the Middle Palaeolithic. Kozłowski concludes that convergent development of leaf points therefore took place several times in different regions, in relation to specific environmental conditions. The idea of convergence is also very briefly explored by Otte (pp. 183-192), who believes that bifacial technology is the product of both cultural influences and convergences due to technological and environmental constraints.

Aubry and his colleagues (pp. 165-182) present the results of a study of intra- and inter-regional variability in Solutrean laurel leaf point production in central France and Portugal. They show that a variety of shaping and sharpening techniques was used to produce the apparently morphologically uniform Solutrean points, and though there are differences visible between the points in the two geographic areas they examine, there is also a high degree of homogeneity in production technique at a regional level. They conclude that the consistency of behaviour exhibited throughout the Solutrean technocomplex

area in southwest Europe, demonstrated by the selection of translucent varieties of flint for the manufacture of the points, can only be explained by a network of long-distance social contacts extending beyond regional group limits.

Against the tyranny of typologies

Nowell and her coauthors (pp. 193-208) argue that although typologies are indispensable because they condense information and provide archaeologists with a common framework for analysis, at the same time they condition what we see, since using typology as an overlay on assemblage variability largely predetermines the number of types that will be recognised and the degree of standardisation to which these types conform. They advocate a new approach whereby a biface, or indeed any artefact, is scanned and each pixel of the outlined perimeter is then exported as X and Y coordinates into a spreadsheet. The data can then be analysed using 'deformable models' to measure the symmetry and standardization of the biface.

Shott (pp. 251-271) also questions the use of archaeologically defined biface types as approximations for ideal types that possess historical, social and historical meaning, since, he argues, they are derived from an artificial partition of a time-dependent continuum of metric variation; as such they are abstractions, not real categories. Instead he advocates the use of whole-object methods, such as polar-coordinate coding schemes, which better represent form and reveal otherwise imperceptible variation. In this study he examines size and form in triangular arrowheads from single-component assemblages in the central Illinois Valley forming a rough time series of AD 600-1400.

Hi-tech Paleoindians

Bamforth (pp. 209-228) investigates the widely held tenet that Palaeoindian groups in North America were 'high-tech' foragers who moved unpredictably within very large areas, and that this pattern of land-use would have made a sophisticated and flexible biface-based technology advantageous. They therefore manufactured long-use life, multifunctional tools, including bifaces, which were designed to be recycled from one form to another. As such, bifaces were designed to serve first as cores, and later as preforms to be reduced into finished tools. Shott's analysis of the Allen site, a Palaeoindian camp in southwestern Nebraska dating to between 11,000 and 8000 BP, suggests that this was not, in fact, the case. The occupants of the site made bifaces for reduction directly into finished knives, and relied on cores for the great majority of their non-bifacial tools. Bifacial cores were produced only infrequently, and there is no evidence that the cores themselves were ever reduced into tools. The Allen site assemblage therefore does not match the assemblage level expectations of the 'hi-tech forager hypothesis'.

Hofman (pp. 229-249) argues that Folsom technology was highly curated and flexible, to the extent that the 'high-tech' hunters were liberated from concern for locating alternative lithic resources during the pursuit of the bison, their key economic resource. This technological flexibility or freedom was enabled by the use of high-quality lithic resources to which the group consistently returned. Before a hunt, the gearing-up

process would have been based on the amount of required weaponry needed to procure the required number of bison, while return movements after the hunt would have de-emphasised stone tools in favour of other critical products and equipment. Such a model suggests directional movement of lithics away from key source locations towards bison hunting areas. Hofman tests this model on a sample of artefacts from various counties in northeastern Colorado and southwestern Nebraska, and shows that the procurement, transport and use of the lithic raw materials used in their technology was indeed unidirectional.

The volume concludes with an overview by Derek Roe (pp. 273-285), who has been studying British and African Acheulian handaxes for more than four decades. Roe stresses the importance of gathering data first-hand in order to gain a suitable degree of acquaintance with the objects being studied, rather than using and manipulating numerical data recorded, stored and made available by someone else.

Each paper has its own merits and makes interesting reading, but what of the volume as a whole? To quote from the Preface, "this book thus presents coverage on most of the major biface technologies known to prehistoric archaeologists. Is the scope too large? What is the point, after all, of comparing such disparate things as Mississippian projectile points and Acheulian handaxes? Technologically, morphologically, and functionally, they must represent different things made by two or more different species of hominids. But as important as it is to understand differences among different lithic types and industries, it is equally important to understand what they have in common. The one way to do that is to bring together such a wide variety of studies" (Soressi & Dibble: xiii). Having read the various papers more than once, I am convinced that the scope of the book is indeed too large, and that this wide variety of studies shows that Mississippian projectile points and Acheulian handaxes have absolutely nothing in common, beyond the fact that they are bifaces. Furthermore, as outlined above, each of the papers has its own distinct agenda, and there is little overlap between them. As a result the volume is a miscellany of largely disparate topics which ultimately fails in its stated aim to provide the first comprehensive overview of bifacial technology.

The Museum of Archaeology and Anthropology of the University of Pennsylvania is a reputable publishing company. It is therefore disappointing to see that the volume is so full of typographical errors. Though some of these could be seen to be amusing, such as "kidknapping debitage" instead of "flintknapping debitage" on page 116, one does not expect such a poor quality of production in a book priced at \$59.95.

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Vashon Island Archaeology: A View from Burton Acres Shell Midden (2002). Edited by Julie K. Stein and Laura S. Phillips, Burke Museum of Natural History and Culture Research Report No. 8., University of Washington Press: Seattle. 168 pp., index. Price: \$30.00 (paperback). ISBN: 029598287X.

Reviewed by Jon Daehnke, Department of Anthropology, University of California at Berkeley, Berkeley, CA 94720

Burton Acres Shell Midden is located in Southern Puget Sound at the easternmost tip of the Burton Peninsula on Vashon Island. Salmon, herring, and a variety of shellfish were once abundant in the area and the Burton Peninsula provided an ideal spot for catching and processing fish and shellfish. The shell midden at this location was first officially recorded in 1994, and by 1995 it was suggested that the midden be nominated as a King County Landmark. But erosion due to constant wave action, as well as damage caused by an intense winter storm in 1995, led to concern that the site was rapidly disappearing and that much of the cultural material had already been washed away. In an effort to preserve and recover what remained of the site, a collaboration between the University of Washington, Burke Museum, the Puyallup Tribe, McMurray Middle School, King County Landmarks and Heritage Commission, and the Vashon Park District was established. The result of this collaboration was the Burton Acres Archaeological Project and Vashon Island Archaeology.

Four 1 meter by 1 meter units were excavated during the two week duration of the Burton Acres Archaeological Project. Much of Vashon Island Archaeology consists of description and analysis of the materials excavated from these units. Julie K. Stein reports on stratigraphy and dating, MaryAnn Emery looks at historic artifacts, Timothy Allen analyzes lithic materials, Laura S. Phillips studies bone and antler tools, faunal analysis is conducted by Kristine Bovy, Robert Kopperl, Virginia Butler, and Laura S. Phillips, and analysis of the botanical materials is conducted by Nancy A. Stenholm. What we learn about the history of Vashon Island from the recovered data is neither surprising nor revolutionary. We learn that occupation at the site dates to at least 1,000 years ago, fish seem to have been a more important resource at the site than birds or mammals, shellfish remains dominate the site, a few animal species that are not present in the area today are present in the archaeological record, and the Hudson Bay Company, despite its close geographic proximity, seemed to have little influence on the people who historically lived on Vashon Island.

The strength of Vashon Island Archaeology, however, is not analysis and description. Rather, the book is valuable because of what it says about the importance of collaboration,

community involvement, and public outreach in a modern archaeological context. For instance, the first chapter - written by Judy Wright, a member of the Puyallup tribe - stresses the importance of collaboration. Wright notes that relationships between archaeologists and Indian tribes historically have been tenuous at best. The Puyallup Tribe, however, was an integral component at every stage of the Burton Acres Archaeological Project, ultimately turning skepticism and wariness into trust. Wright also notes that the project was valuable because archaeological evidence demonstrated the presence of the tribe on the island for quite some time, suggesting that Native distrust of archaeology is fueled less by anti-scientism and more by a history of little respect and a lack of consultation.

Community involvement and public outreach are the focus of chapter 4. This chapter, written by Mary Parr, Julie K. Stein, and Laura S. Phillips, describes field and laboratory methods and procedures. Central to the Burton Acres Archaeological Project was the participation of students from a local middle school. These students were involved not only with excavation, screening and sorting of artifacts, but also served as tour guides and assistants to those members of the general public that volunteered for the project. Furthermore, all participants experienced the entire field and laboratory process. Participants first excavated two liters of material from one of the units. Next, they took their two liters to the screening station where it was weighed and screened through 1 inch, 1/2 inch, 1/4 inch and 1/8 inch mesh. With the assistance of staff archaeologists, the screened material was then sorted and, if possible, identified. Finally, data was recorded and catalogued. On average, the entire process took about 3 hours. At every step of the process staff archaeologists stressed the methods of archaeology and participants were encouraged to offer their interpretations of the archaeological record. The importance of this approach to outreach is that it demonstrates to participants that excavation is only the initial stage in the archaeological process, and not even the most time consuming stage (the authors note that participants were often surprised at just how long sorting, identification and cataloging took). Furthermore this approach stresses that the goal of archaeology is not to excavate artifacts, but to record, catalogue and analyze those artifacts so that we can interpret the past. Ultimately, the focus is on methods, and I believe this is the most effective way to approach outreach.

The book, however, is not without its flaws. For instance, it is at times unclear who the intended audience is. Some chapters seem to be written with a lay audience in mind, while other chapters, especially those that read as fairly straightforward lab reports, seem to have been written for other archaeologists. This is, however, somewhat unavoidable in an edited volume of this type and is not a major detriment to the work. My only other criticism is one of emphasis. The value of Vashon Island Archaeology lies less in what it tells us about the past and more in what it tells us about the present and the future of archaeology. By the end I found myself wanting to read less artifact description and analysis and more about the intricacies of collaboration and public involvement. Still, Vashon Island Archaeology at least outlines a working model for archaeological practice in the 21st century, and this alone is sufficient to make it a valuable work.

Upcoming Conferences

Colleen P. Stapleton, Associate Editor

2004

- Nov. 7-10, Quaternary Paleoenvironments of the Middle East: Proxy Records, Human Prehistory, and Regional Cross-Correlation, GSA Topical Session 102, Denver, Colorado, USA. Sponsored by the Archaeological Geology Division and the Quaternary Geology and Geomorphology Division. Conveners: Carlos E. Cordova (cordova@okstate.edu), Caroline P. Davies (daviesc@umkc.edu). General information: www.geosociety.org/meetings/2004
- Nov. 15-16, Eastern Analytical Symposium, Somerset, NJ, USA. Regular session on Conservation Science. Contact: John Scott, email: info@NYCF.org, fax: 212-714-0149. General information: www.NYCF.org/eas.html.
- Nov. 15-17, Arts and Surfaces, Dijon, France. Session A of 18th International Conference on Surface Modification Technologies. a multidisciplinary discussion on the science and technology of surface related phenomena for all materials employed. Session organizer: Alessandra Giumlia-Mair. General information: www.congres-scientifiques.com/smt18
- Nov. 17-21, 18th Annual Ceramic Ecology Symposium 2004, AAA Annual Meeting, San Francisco, USA. Organizers: Charles C. Kolb (ckolb@neh.gov), Louana M. Lackey (Maryland Institute College of Art). General information: www.aaanet.org/mtgs/mtgs.htm
- Nov. 29-Dec. 3, Materials Issues in Art and Archaeology VII, Materials Research Society, Boston, USA. Symposium organizers: Pamela Vandiver, tel 520-400-2270, fax 520-621-8117, email: vandiver@mse.arizona.edu; Jennifer Mass, tel 302-888-4808, fax 302-888-4838, email: jmass@winterthur.org, Alison Murray, tel 613-533-6000 x-74338; fax 613-545-6889, email: am26@post.queensu.ca, John Merkel, tel 44-171-387-7050, fax 44-171-3832572, email: j.merkel@ucl.ac.uk. General information: www.mrs.org/meetings/fall2004/program/cfp_oo.html.
- Dec. 7-11, Science and Technology in Archaeology and Conservation, Hashemite University, Jordan. Contact: Prof. Talal Akasheh, email: takasheh@index.com.jo, tel.: 00962-5-382 6600 ext.: 4488, fax: 00962-5-382 6613, General information: www.hu.edu.jo/Inside/About/default.htm.
- Dec. 13-17, Climate and chronology special sessions at American Geophysical Union Fall meeting, San Francisco, USA. High Frequency Climate Changes, Past, Present and Future, contact Jasper Knight: j.knight@exeter.ac.uk. Tephrochronology North Pacific Volcanic Arcs, contact Christopher Waythomas, chris@usgs.gov. General information: <http://www.agu.org/meetings/fm04/>.

2005

- Jan. 5-10, Society for Historical Archaeology Conference on Historical and Underwater Archaeology, York, UK. General information: www.sha.org/About/Conferences/mt2005.htm.

- Jan. 6-9, Archaeological Institute of America, Boston, USA.
General information: www.archaeological.org.
- Feb. 12, Southeast Conference on Mesoamerican Archaeology and Ethnohistory, University of South Florida, Tampa, USA.
General information: uweb.cas.usf.edu/~cwells/SECMAE.htm.
- Mar. 21-24, Computer Applications in Archaeology, Tomar, Portugal. Abstract deadline: 31 Jan 2005. Contact: Secretary, Instituto Politecnico de Tomar, Departamento de Gestao do Territorio, CAA 2005, Av. Quinta do Contador, 2300 Tomar, Portugal. Email: caa2005@ipt.pt. General information: www.caa2005.ipt.pt/index.html.
- Mar. 30-Apr. 3, Society for American Archaeology Annual Meeting, Salt Lake City, USA. Themed session on "Lithic Reduction Analysis and Problems of Prehistory", contact Harry Lerner harry.lerner@mail.mcgill.ca. General information: www.saa.org/meetings/index.html.
- Apr. 13-16, UK Archaeological Science Conference, University of Bradford, UK. Abstract deadline: 29 Oct 2004. Email: ArchSci-Conference@Bradford.ac.uk. General information: www.brad.ac.uk/archsci/archsci2005.
- Apr. 13-16, 2nd International Conference on Late Roman Coarse Wares, Cooking Wares and Amphorae in the Mediterranean: Archaeology and Archaeometry, Aix-en-Provence-Marseille-Arles, France. Abstract deadline: 30 Oct 2004. Email: lrcw2@mmsh.univ-aix.fr, tel.: +33 4 42 52 42 68, fax +33 4 42 52 43 75. Congres LRCW2, MMSH, 5 Rue du Chateau de L'Horloge, BP 647, 13094 Aix en Provence Cedex 02, France. General information: www.mmsh.univ-aix.fr/lrcw2.
- Apr. 19-22, Archeometrie 2005, Institut National des Sciences et Techniques Nucleaires (INSTN), Saclay, France. Abstract deadline: 1 Dec 2004. Contact: Secretariat: Anne Morel, Archeometrie 2005, Laboratoire Pierre Sue, Bat 637, CEA Saclay, 91191 Gif sur Yvette, fax : 01 69 08 69 23. General information: www.ladir.cnrs.fr/GMPCA2005/
- Apr. 28-30, Metallurgy - A Touchstone for Cross-Cultural Interaction, British Museum, London, UK. A conference to celebrate Paul Craddock's contributions to the study of metal through the ages. Contact: Susan La Niece: laniece@thebritishmuseum.ac.uk. General information: www.thebritishmuseum.ac.uk/science/whatsnew/metals%20conf%201.htm
- May. 15-19, 8th International Conference on Non-Destructive Testing and Microanalysis for the Diagnostics and Conservation of the Cultural and Environmental Heritage, Lecce, Italy. Abstract deadline: 31 Oct 2004. Contact: Scientific Secretariat, Istituto Centrale per il Restauro (ICR), attn. Marcella Ioele Piazza San Francesco di Paola, 9, I 00184 ROMA, tel +39 06 4889 6270/6233, TFX +39 06 4815 704, e-mail: art2005@beniculturali.it. General information: www.dsm.unile.it/art05.
- Jun. 5-10, CANQUA (Canadian Quaternary Association), Winnipeg and Regina, Canada. Contact D. Sauchyn (sauchyn@uregina.ca) or J. Teller (tellerjt@ms.umanitoba.ca), co-chairs. General information: www.mun.ca/canqua/index.html.
- Jun. 8-13, 33rd American Institute of Conservation (AIC) Annual Meeting, Minneapolis, USA. General information: aic.stanford.edu/meetings/index.html
- Jun. 28-Jul. 1, Heritage, Microbiology and Science, Portsmouth, UK. Contact: Dr. Alison Webster, HMS Secretariat, email: hms2005@port.ac.uk, tel: +44 2392842072, fax: +44 2392842070. General information: www.hms2005.org.
- Jul. 25-29, 11th International Conference on Luminescence and Electron Spin Resonance Dating (LED 2005), Kardinal-Schulte-Haus, Bergisch-Gladbach, Cologne, Germany. General information: www.uni-koeln.de/LED2005.
- Aug. 28-31, 5th International Bone Diagenesis Meeting, University of Cape Town, South Africa. Abstract deadline: 31 January 2005. Contact: Julia Lee Thorp, jlt@science.uct.ac.za, Convenor & Chair of the Organising Committee. General information: www.cmc.uct.ac.za/conferences/2005/boneddiag/info.html.
- Sep. 12-16, 14th ICOM-CC, The Hague, The Netherlands. Contact: Congress ICOM-CC 2005, Floortje Kok, Keizersgracht 497, PO Box 76709, 1070 KA Amsterdam, The Netherlands, tel: +31 20 305 45 20, fax: +31 20 305 45 00, email : icom-cc2005@icn.nl. General information: www.icom-cc2005.org/intro/harikete/
- Sep. 12-16, 22nd International Meeting on Organic Geochemistry, Seville, Spain. Papers sought on "New Trends in Organic Geochemistry", including studies from archaeology, biochemistry, and DNA. Abstract deadline: 7 Jan 2005. General information: www.imog05.org.
- Sep. 28-29, Metallurgy in Southeast Europe from Ancient Times till the End of 19th Century, Sozopol, Bulgaria. Abstract deadline: 30 Jan 2005. Union of Bulgarian Metallurgists, 108 Rakovsky Street, 1000 Sofia, phone/fax:(+3592) 986 2964, e-mail: bum@ttm.bg. General information: www.bum.ttm.bg/3thIntSymposium_en.htm.
- Sep. 26-29, Archaeometallurgy Session, Materials Science & Technology 2005 (MS&T '05), Pittsburgh, PA, USA. The third in a series of multidisciplinary annual conferences held by and for professionals in the metals and materials community. Sponsored by TMS, the Association for Iron & Steel Technology, ASM International, the American Ceramics Society, and the American Welding Society. Session organizers: Mike Notis, Heather Lechtman, Pam Vandiver, Martha Goodway. Contact: TMS Meetings Services, 184 Thorn Hill Road, Warrendale, PA, 15086; tel: (724) 776-9000, ext. 243; fax: (724) 776-3770; e-mail: mtgserv@tms.org. General info: www.matscitech.org.
- Sep. 29-Oct. 1, 3rd Forbes Symposium on Scientific Research in the Field of Asian Art, Freer Gallery of Art, Washington, DC, USA. Abstract deadline: 31 Jan 2005. Email: dcsr@asia.si.edu; fax: 202-633-9474. General information: www.asia.si.edu/visitor/dcsrSymposium.htm.
- Oct. 25-29, European Meeting on Ancient Ceramics (EMAC 05), Lyon, France. First circular. Contact: EMAC' 05, Laboratoire de ceramologie, UMR5138, Maison de l'Orient et de la Mediterannee, 7 rue Raulin, 69365 LYON cedex 7, FRANCE; tel: 33 (0)4 72 71 58 71, fax: 33 (0)4 78 69 82 31, email: emac05@mom.fr

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