

# International Association for Obsidian Studies Bulletin

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IAOS Business Address: Michael A. Gottesman, IAOS Secretary-Treasurer, 4921 Arvada Street, Torrance, CA 90503

Bulletin assembled and edited by Suzanne Stewart

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## NEWS AND INFORMATION



An Introductory Message from  
Geoffrey E. Braswell  
New President of the IAOS

Dear IAOS Members,

This has been an active year for the IAOS. As the new president of the association, I would like to take this opportunity to discuss some of the successes of the past year, and to discuss the future of our organization.

To begin with, I thank Dave Frederickson and Pat Dunning for their superb service as President and Secretary-Treasurer of the IAOS. A special thanks is due to Suzanne Stewart for her diligent work on the Bulletin. Suzanne will stay on as Editor through the fall, aiding in the transition to our new editors: William McFarlane (SUNY-Buffalo) and Carleen Sanchez (UC-Santa Barbara). Contributions for up-coming issues may be mailed to Suzanne until 15 September 1999. After that date, they should be sent to William McFarlane, IAOS Bulletin, 380 MFAC/Ellicott Complex, SUNY-Buffalo, Amherst, NY 14261.

This year has seen a number of exciting events sponsored by the IAOS. A special session on the effects of thermal damage on obsidian hydration dating was held at

the 1999 Society for California Archaeology Annual Meeting in April [see abstracts, this issue]. In addition, members of the IAOS presented papers at the 10th Annual Workshops in Archaeometry Conference at SUNY-Buffalo in February. Our involvement in regional meetings like this is crucial to the association, since our U.S. membership is divided between both coasts. I very much hope that another IAOS-sponsored session will appear at next year's California meeting. We will be holding the next Archaeometry Conference at SUNY-Buffalo the weekend of 19-20 February 2000, and members of the IAOS will be receiving an announcement about that event shortly.

Craig Skinner, our Webmaster, continued development of the IAOS site this past year. It is well worth a look, containing not only information about the association, but also back editions of the Bulletin, a directory of obsidian laboratories, a world obsidian-source catalog, abstracts and full texts of articles, and connections to other internet resources on obsidian, archaeometry, and GIS. The address for the home page is [www.peak.org/obsidian/obsidian.html](http://www.peak.org/obsidian/obsidian.html).

Despite these successes, our membership has decreased slightly in the past few years. In particular, we have not been successful at gaining and keeping new membership. This is particularly surprising when one considers how many papers on obsidian studies are given at conferences like the SAAs. In part, the decrease in membership may be due to the perception that the IAOS is primarily focused on obsidian hydration and chemical provenience studies: two critically important, but relatively narrow fields of inquiry in obsidian studies. But it is also due to our relatively low profile. I ask all of you who find the IAOS a useful organization to bring it to the attention of your colleagues and students. And remember, students who submit an article to the Bulletin are given a free one-year membership.

A few important items were handled at this year's business meeting. First, an announcement was made regarding the election of incoming officers. Mike Gottesman is our new Secretary-Treasurer, and J. Michael Elam is President-elect. Both have contributed regularly to the association, and we are fortunate that the future of the IAOS is in their hands. Second, and at the suggestion

of former President Dave Fredrickson, we discussed the possibility of altering our bylaws to give all officers a two-year term. Dave felt that one year only gave an officer "a chance to learn the ropes." Such a change, if implemented, would not affect the terms of present or elected officers. We plan to put these, and other suggested changes, to a general vote this year.

As many of you know, the IAOS has its annual business meeting during the Society for American Archaeology meetings. What may be less well-known is that this event is open to all members of the association. (This March in Chicago, less than a dozen people attended.) The meeting is a good opportunity to get to know how the group operates and to give us feedback on what you like or dislike about the IAOS. I encourage all members to try to stop by next year in Philadelphia.

Sincerely,  
Geoff Braswell

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*An offer you can't refuse:*

## **TRY SOME OHD - FREE**

by Mike Gottesman

Over the past 4 years, UCLA has conducted a large number of obsidian dating projects using the Ambrose/Stevenson relative density/oh% method plus Trembour salt cells derived environmental data. We now have over 1300 dates from over 60 sites – the majority of which are from California (plus New Mexico, various Mayan sites, Mexico, and Argentina).

While the method must still be classified as experimental, the results are quite encouraging. It is my opinion that the resultant dates are within an archaeologically useful accuracy (i.e., beyond relative dating) often enough, and that most of the "incorrect" dates can be explained. This is not a "flavor-of-the-month" approach but rather it is another arrow in your how-old-is-it? quiver.

We would like to extend the range/type of dating projects to especially include sites with good alternative dating information AND particularly

### ***International Association of Obsidian Studies*** **1999–2000**

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Secretary-Treasurer	Michael A. Gottesman
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web site: <http://www.peak.org/obsidian/obsidian.html>

from those of you who have not tried this technique before.

So here's the deal: If you have a project that is already completed – send me 10 samples of the parent obsidian from which hydration data is known. I will need the rind measurements, along with some basic information about the site from which to estimate relative humidity (RH) and the effective hydration temperature (EHT).

I will date these and send you an informal report. The only cost is that you send me at least an informal report on how the data fits in with prior conclusions, your opinion on the method, and whether or not you would consider it for future work. (I can also provide reference data, a "pro-forma" formal report and – after proper coordination – share data from other sites in your area of interest.)

Contact me at: [mgottesm@ucla.edu](mailto:mgottesm@ucla.edu)

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## ABSTRACTS AND ANNOTATIONS

Compiled by Pat Dunning, Janine Loyd, Suzanne Stewart

Acquafredda, P.T. Andriani, S. Lorenzoni, and E. Zanettin

Chemical Characterization of Obsidians from Different Mediterranean Sources by Non-Destructive SEM-EDS Analytical Method. *Journal of Archaeological Science* (1999) 26,315-325.

The aim of our research is to check the SEM-EDS non-destructive analytical method for discriminating the possible sources of obsidian artefacts. Moreover, in order to obtain a significant discrimination of Mediterranean obsidians we analysed samples collected from outcrops of the major sources: Monte Arci (Sardinia) and Palmarola, Lipari, Panterellia, Giali and Melos islands. All samples were analysed by both XRF (whole rock) and SEM-EDS (glass and microliths-microphenocrysts). The XRF analysis reveals that the major elements discriminate obsidian. The discrimination using major elements is very useful because the amount of trace elements is lower than the detection limit of a Si(Li) ED Detector. The major elements, particularly SiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>, CaO, Na<sub>2</sub>O and K<sub>2</sub>O, of obsidian glass discriminate the six main Mediterranean sources. Our work demonstrates, therefore, the possibility of discriminating different provenance of obsidian artefacts using SEM-EDS, by means of a relatively rapid, effective, and above all non-destructive method.

Bettinger, Robert L., and Jelmer Eerkens

1999 Point Typologies, Cultural Transmission, and the Spread of Bow-and-Arrow Technology in the Prehistoric Great Basin. *American Antiquity* 64(2):231-242.

Decrease in projectile point size around 1350 B.P. is commonly regarded as marking the replacement of the atlatl by the bow and arrow across the Great Basin. The point typology most widely employed in the Great Basin before about 1980 (the Berkeley typology) uses weight to distinguish larger dart points from smaller, but similarly shaped, arrow points. The typology commonly used today (the Monitor typology) uses basal width to distinguish wide-based dart points from narrow-based arrow

points. The two typologies are in general agreement except in central Nevada, where some dart points are light, hence incorrectly typed by the Berkeley typology, and in eastern California, where some arrow points are wide-based, hence incorrectly typed by the Monitor typology. Scarce raw materials and resharpening may explain why dart points are sometimes light in central Nevada. That arrow point basal width is more variable in eastern California than central Nevada likely reflects differences in the cultural processes attending the spread and subsequent maintenance of bow-and-arrow technology in these two localities.

Kealhofer, Lisa, Robin Torrence, and Richard Fullagar

Integrating Phytoliths within Use-Wear/Residue Studies of Stone Tools. *Journal of Archaeological Science* (1999) 26, 527-546.

Analyses of phytolith assemblages extracted from residues on obsidian artefacts and from the surrounding soil matrix of two sites in Papua New Guinea address two important methodological issues. First, multivariate analysis of phytolith assemblages extracted from the edges of stone artefacts, from soil directly in contact with the artefact, and from soil derived from the same archaeological context demonstrates the integrity of phytolith residues. Second, reconstructions of tool use based on the analysis of phytoliths are compared with results from an independent use-wear/residue study. The interpretation of phytolith assemblage variability enhances and strengthens the use-wear/residue results. Finally, integrating the phytolith data within the broader use-wear/residue study produces significant new findings about changes in obsidian tool-use in prehistoric Papua New Guinea.

Barrett, Thomas P., (New Mexico) and Robert S. Santley (New Mexico)

Obsidian Technology & Assemblage Variation on the Gulf Coast of Veracruz, Mexico. Paper presented at the 64<sup>th</sup> Annual Meeting of the Society for American Archaeology, Chicago, Illinois, March 1999.

This paper examines the variation in obsidian assemblages from two survey regions in Veracruz, Mexico. Extensive archaeological survey has been

conducted in the Tuxtlas and Hueyapan regions and these sizeable collections are compared. Principal variation in technology is witnessed in both source material and reduction strategy. As well, it appears that distinct distribution patterns exist in production and consumption loci. The technical variation is described and spatial patterning is presented to model the production distribution systems in these two regions. These preliminary results are discussed and the paper concludes with directions for future research on Mesoamerican obsidian technology.

Baugh, Timothy (TRC/Mariah Assoc., Inc.), John A. Torres (Navaho Nation Archaeology Dept.), & Ronald H. Towner (Arizona/LTRR).

Comparative Approaches to Dinetah & Plains Exchange from the Late Prehistoric through Historic Periods Paper presented at the 64<sup>th</sup> Annual Meeting of the Society for American Archaeology, Chicago, Illinois, March 1999.

The distribution of Jemez Mountains obsidian in the Four Corners and Plains regions during the late prehistoric through historic periods can be modeled to examine the temporal dynamics of exchange. This comparative paper focuses on the Dinetah and Gobernador phases associated with the Navajo in northwest New Mexico and various cultural phases associated with the Wichita and Pawnee in the southern and central Plains. Beginning as simple linear or down-the-line exchange in both regions, the Dinetah and Plains peoples transform exchange into more complex regional systems. These are best modeled as Parteto systems, which utilize collection points for wider distribution.

Burleson, Richard L. (New Mexico State)  
Lithic Microwear Analysis of the Postclassic Maya Site Isla Cilvituk: "Cutting Edge" Procedures for Determining Stone Tool Functions. Paper presented at the 64<sup>th</sup> Annual Meeting of the Society of American Archaeology, Chicago, Illinois, March 1999.

The goal of any microwear analysis is to reconstruct as completely as possible the site economy. Once accomplished, such lithic data can then be incorporated into more complex interpretations concerning economic, social, and

political organization. This research focuses on the obsidian assemblage from the Postclassic Maya site Isla Cilvituk (A.D. 900-1545). A replica set of prismatic blades have been subjected to a full range of activities associated with prehispanic behavior in order to create use-wear patterns of a known origin. These known use-wear patterns will in turn be compared to the archaeological assemblage via high-resolution microscopy in an attempt to determine specific stone tool function.

Glascock, Michael D. (Missouri-Columbia), William J. Parry (CUNY Hunter College), Cynthia L. Otis Charlton (Iowa), Thomas H. Charlton (Iowa), & Hector Neff (Missouri-Columbia)  
Obsidian Sources Supplying the Aztec City-States of Otumba and Tepeapulco. Paper presented at the 64<sup>th</sup> Annual Meeting of the Society of American Archaeology, Chicago, Illinois, March 1999.

The Aztec city-states of Otumba and Tepeapulco had large numbers of craft workshops producing a variety of goods from obsidian. Both city-states manufactured cores, prismatic blades, and bifaces; Otumba also produced lapidary items such as ear spools. Although Otumba is in close proximity to an obsidian source, neutron activation analysis indicates that substantial quantities of obsidian for use in both city-states was obtained from the more distant Pachuca source, as well as other sources including Paredon, Tulancingo, Tepalzingo, and Orizaba. This report will detail the results obtained.

Gudino, Alejandra (Missouri-Columbia), Gonzalo Correal Urrego (Universidad Nacional, Columbia), Michael D. Glascock (Missouri-Columbia), Hector Neff (Missouri-Columbia), & Sergio Herrera (Missouri-Columbia)  
Análisis de la Composición Química de la Obsidiana de un Sitio Cazador-Recolector en Pubenza, Columbia. Paper presented at the 64<sup>th</sup> Annual Meeting of the Society of American Archaeology, Chicago, Illinois, March 1999.

Sito de Pubenza se localiza en un corredor geográfico permanente que favoreció el desplazamiento de megafauna hacia el altiplano. De este sitio de aprovisionamiento se rescató el testimonio de un antiguo pantano y restos de

tortugas, roedores, armadillos, polen, cangrejos, caracoles, ocre rojo, resina, huesos de mastodontes, gliptodontes, y una lasca de obsidiana. Esta y una muestra del flujo del cerro del Machin se analizaron empleando INAA (Instrumental Neutral Activation Analysis), se compararon sus huellas químicas con las de otros flujos analizados en MURR y se concluyó que estas forman parte de un nuevo flujo de obsidiana para Columbia.

Haney, Daniel M. (Colorado-Boulder)

A Use Wear Analysis of Obsidian Tools from the Classic Southern Mesoamerican Site of Ceren, El Salvador: A Low-Power Approach. Paper presented at the 64<sup>th</sup> Annual Meeting of the Society of American Archaeology, Chicago, Illinois, March 1999.

The exceptional preservation of microblades, prismatic blades, and scrapers excavated from systemic context at the Classic Southern Mesoamerican site Cerén, El Salvador, provides a unique opportunity for an analysis of use wear using low-power magnification. The use wear on replicated obsidian tools is compared with the use wear identified on the obsidian artifacts from Cerén to facilitate the functional interpretation of these artifacts. The analysis indicates that functional interpretations can be assigned to many of the tools, including how they were used and the probable range of materials processed by the ancient inhabitants.

Healan, Dan (Tulane)

Obsidian Core/Blade Production in a Postclassic City. Paper presented at the 64<sup>th</sup> Annual Meeting of the Society of American Archaeology, Chicago, Illinois, March 1999.

Domestic lithic assemblages from residential excavations and debitage and other materials recovered from excavation of an urban core/blade workshop provide a very large and strikingly homogeneous body of data pertaining to the production and consumption of obsidian core/blade artifacts at Early Postclassic Tula. These data reveal highly specialized and systematized strategies of procurement, manufacture, and consumption believed to reflect the changing role of core/blade production in the wake of the urbanization of prehispanic Mesoamerica.

Hirth, Kenneth (Penn State)

Craft Specialization and the Production of Obsidian Prismatic Blades at Xochicalco, Mexico. Paper presented at the 64<sup>th</sup> Annual Meeting of the Society of American Archaeology, Chicago, Illinois, March 1999.

This paper examines the natural and cultural conditions that shaped the production of obsidian prismatic blades in specialized workshop areas at the urban center of Xochicalco, Mexico, during the Epiclassic period (A.D. 650-900). Analysis reveals that obsidian was imported to Xochicalco as already shaped and utilized prismatic blade cores that were used and rejuvenated before being completely exhausted. Because obsidian was scarce several technological innovations were associated with maximizing prismatic blade production within workshop contexts, including the preparation of platforms on rejuvenated cores using pecking and grinding techniques and the removal of small blades using a hand-held technique.

Kindon, Andrew (UC Los Angeles), and Samuel Connell (UC Los Angeles)

Xunantunich Obsidian: From Bloodletting to Shaving. Paper presented at the 64<sup>th</sup> Annual Meeting of the Society of American Archaeology, Chicago, Illinois, March 1999.

Analysis of obsidian collected over the last seven years by the Xunantunich Archaeological Project generated a comparative data set through which the sociopolitical and economic relationships between the ancient Maya city of Xunantunich and various settlements in the surrounding region are explored. The resulting interpretive comparisons provide a regionally based test of the appropriateness of viewing obsidian as a "prestige-good," and in a more general sense further our understanding of the nature of sociopolitical and economic connections between Maya elites and their immediate periphery.

Knight, Charles (Pittsburgh)

More than Microcores: Obsidian Core-Blade Technology during the Late Formative to Classic Period in Southern Veracruz, Mexico. Paper presented at the 64<sup>th</sup> Annual Meeting of the Society of American Archaeology, Chicago, Illinois, March 1999.

Excavations and surface collections undertaken through 1997 at the Late Formative to Classic period site of Palo Errado, in southern Veracruz, Mexico provided data for investigating the nature of obsidian core-blade technology at the site. The presence of large, blocky obsidian debitage suggests the importation and subsequent on-site reduction of quarried material at Palo Errado. New interpretations of the nature of obsidian production, distribution, and consumption of obsidian in the southern Gulf Coast are presented. Finally, the results are couched within the regional context to better understand the interaction between Palo Errado, and the nearby center of Tres Zapotes.

Nichols, Deborah L. (Dartmouth), Hector Neff (Missouri-Columbia), Thomas H. Carlton (Iowa), & Michael D. Glascock (Missouri-Columbia) Geochemical Source Determination and Post-classical Political Economies. Paper presented at the 64<sup>th</sup> Annual Meeting of the Society of American Archaeology, Chicago, Illinois, March 1999.

The Aztec empire and other expansionist states of the Postclassic period developed from a structure of militaristic city-states. State evolution during the Postclassic also involved significant economic changes, including increased specialization, market exchange, and agricultural intensification. The application of methods of geochemistry-based source determination to archaeological data is providing significant new information on Postclassic systems of production and distribution in goods made of ceramics and chipped and ground stone. This paper discusses the methods employed in source-determination studies, their contribution to understanding Postclassic political economies, and theoretical and methodological issues raised by this recent research.

Norris, Susan (Harvard)

Lithic Reduction Technology in the Aztec Provinces: Urban and Rural Evidence from Morelos. Paper presented at the 64<sup>th</sup> Annual Meeting of the Society of American Archaeology, Chicago, Illinois, March 1999.

Excavations of households at the urban center of Yautepec, and rural sites of Capilco and Cuexcomate have provided an extensive lithic assemblage. Preliminary results indicate that obsidian prismatic blades were produced in this provincial region of the Aztec empire. The distinctive reduction technology was undertaken in the urban center and was based at least in part on the utilization of "lunate" cores. The data will be evaluated in the context of current models of the organization of lithic production during the Late Postclassic of Central Mexico. The results have implications for the structure of the local, regional, and interregional economies.

Pastrana, Alejandro (INAH, Mexico)

Aztec Obsidian Exploitation and the Production of Prismatic Blades at the Sierra de Las Navajas, Mexico Obsidian Quarry. Paper presented at the 64<sup>th</sup> Annual Meeting of the Society of American Archaeology, Chicago, Illinois, March 1999.

Obsidian tool production at the Sierra de Las Navajas (Pachuca) obsidian quarry included bifacial preforms, a variety of preformed ritual objects, and prismatic cores for the removal of prismatic blades. Final finishing of these items was completed in workshops at sites in the area of their final distribution. This paper discusses a mining camp and prismatic blade workshop at the Las Navajas quarry where blades were produced using a variety of techniques that appear to have been utilized in the domestic activities of miners and associated craftsmen.

Rizo, Michael (Arizona State)

Temporal Change in Prismatic Blade Use at Urichu, Michoacan. Paper presented at the 64<sup>th</sup> Annual Meeting of the Society of American Archaeology, Chicago, Illinois, March 1999.

Recent research at Urichu, Michoacan has revealed an apparent shift in local elite social

organization through time. Two very distinct archaeological assemblages are associated with the Classic/Epiclassic and Postclassic time periods. Between these two assemblages, a rise in the quantities of gray-black prismatic blades brought to the site through time is observed in conjunction with the transformation of the elite class at Urichu and other sites in Central Michoacan. However, the relative amount of green obsidian blades seems unaffected by this elite class transformation and remains constant from the Middle Classic to the Late Postclassic.

Silliman, Stephen (UC Berkeley)  
Obsidian Use in the 19<sup>th</sup> Century: New Data from Northern California. Paper presented at the 64<sup>th</sup> Annual Meeting of the Society of American Archaeology, Chicago, Illinois, March 1999.

Obsidian studies are an integral part of reconstructing prehistoric chronology, trade patterns, and lithic use in various parts of the American West, especially California. However, few archaeologists have focused intently on obsidian for understanding Native American presence at historical sites. Using two 19<sup>th</sup>-century colonial sites in Northern California, this paper will explore how the interplay of obsidian data (i.e. geochemical sourcing, hydration readings), 19<sup>th</sup>-century indigenous and nonindigenous material culture, and historical documents can provide insights into both the structure of native responses to colonization and the very nature of obsidian hydration dating.

Soto y Alvarez, Ma. De los Dolores (Universidad Nacional Autonoma de Mexico)  
The Production of Obsidian Tools at Teuchitlan, Jalisco. Paper presented at the 64<sup>th</sup> Annual Meeting of the Society of American Archaeology, Chicago, Illinois, March 1999.

This paper examines obsidian tool production at the site of Teuchitlan, a large ceremonial and urban center in the western Jalisco during the Classic period (A.D. 200-700). The scale of Teuchitlan's ceremonial architecture is much larger than is found in other areas of West Mexico during this period suggesting it was organized as a complex chiefdom. This presentation explores the organization of obsidian tool production, the degree of craft specialization, and the complexity and variation of

manufacturing techniques used to produce obsidian artifacts at Teuchitlan during the Classic period.

Steffen, Anastasia (New Mexico)  
When Obsidian Goes Bad: Forest Fire Effects on Jemez Obsidian. Paper presented at the 64<sup>th</sup> Annual Meeting of the Society of American Archaeology, Chicago, Illinois, March 1999.

Until recently forest fire effects have been a known but largely unexplored factor in archaeological obsidian research. In this paper I examine the role of fire for archaeological applications of obsidian analysis, with particular emphasis on obsidian hydration. I discuss current results of the Dome Fire Effects Study, initiated to examine the extraordinary fire damage observed at one of the large "Obsidian Ridge" (Rabbit Mountain) prehistoric obsidian quarries in the Jemez Mountains of Northern New Mexico.

Stokes, Brian (Saddleback College)  
Lithic Analysis and Preliminary XRF Study of Obsidian from Residential Contexts at Isla Alor. Paper presented at the 64<sup>th</sup> Annual Meeting of the Society of American Archaeology, Chicago, Illinois, March 1999.

Recent work is beginning to explore the economic activities of residential sites of La Venta. The lithic assemblage recovered from Isla Alor is offering insight into the trade and redistribution of obsidian and other lithic materials during both Olmec and Postclassic periods. A preliminary XRF trace element study has revealed a much greater access to distant obsidian sources at residential sites than previously observed.

Trachman, Rissa M. (Texas-Austin)  
Trade/Exchange, Technology, and Ritual: An analysis of Obsidian Artifacts from an Early Classic Tomb at the Site of Dos Hombres, Belize. Paper presented at the 64<sup>th</sup> Annual Meeting of the Society of American Archaeology, Chicago, Illinois, March 1999.

The 1997 field season of the Programme for Belize Archaeological Project produced a collection of artifacts from an Early Classic Maya tomb, Dos Hombres, Belize. A preliminary study was initiated with three objectives. First, the artifacts were

categorized morphologically to ascertain production technology. Second, a sample of the collection was examined for macroscopic and microscopic use wear patterns in order to determine possible function(s) of the obsidian. Finally, neutron activation analysis was employed to determine the possible source(s) of this material. These analyses were implemented to gain insight into the processes that this assemblage underwent in reaching its provenience, including implications of trade, exchange, and the method of deposit in the context of the tomb.

Tykot, Robert H. (S Florida), Luke R. Adams (Southampton, UK), Byron Bass (Edinburgh), Timothy Kaiser (Royal Ontario Museum), and Staso Forenbaer (S Methodist)  
Prehistoric Obsidian Trade in the Adriatic: New Evidence from Susac and Palagruza. Paper presented at the 64<sup>th</sup> Annual Meeting of the Society of American Archaeology, Chicago, Illinois, March 1999.

Obsidian artifacts have been recovered from Neolithic through Bronze Age contexts on the Adriatic islands of Susac and Palagruza. Obsidian from geological sources on the islands of Lipari, Palmarola, Pantelleria and Sardinia is found at Neolithic sites on the Italian peninsula; obsidian from sources in central Europe has until now very rarely been found as far south as the Mediterranean. This provenance study examines obsidian usage in a "frontier" area between peninsular Italy and southeastern Europe, and provides important information on Mediterranean island colonization, long-distance maritime contacts, and social interaction, influence, and development in these regions.

Yohe, Robert  
1998 The Introduction of the Bow and Arrow and Lithic Resource Use at Rose Spring.  
*Journal of California and Great Basin Anthropology* 20(1): 26-52.

One objective of the most recent re-excavation of the Rose Spring site in eastern California was to evaluate the impact of the bow and arrow on local obsidian exploitation. Part of the strategy of the study involved the collection and analysis of a large sample

of lithic reduction/production waste produced over the 5,500-year occupation of the site. A change was anticipated in the use of bifacial cores with the adaptation of a new hunting technology requiring less lithic material. A model of change was posited and then tested by using the data generated from the study. The results of the analysis indicate the possibility that certain changes in the reduction strategies practiced by the inhabitants of Rose Spring did not become manifest until nearly 1,000 years after the appearance of the bow, suggesting persistence of the use of the dart and atlatl until about A.D. 1500. An alternative interpretation based on obsidian hydration data is also discussed. Depositional mixing late in time, coupled with change in site tool production activities late in time could account for the apparent appearance of continuity of earlier dart point reduction strategies during the long-term use of the site.

**Abstracts from:  
THE EFFECTS OF FIRE/HEAT ON  
OBSIDIAN**

Symposium at the 33<sup>rd</sup> Annual Meeting of the Society for California Archaeology, Sacramento, April 1999. Co-sponsored by IAOS.  
Organizers: Tom Origer and Dave Fredrickson (Sonoma State University)

For several decades, a number of researchers have examined the effects that fire/heat has on obsidian specimens. Some studies were focused on the after-effects of wildfires, some on controlled burns, and still others on conditions created under laboratory conditions. An understanding of the effects of fire/heat on obsidian specimens continues to gain in importance as land managers increasingly use fire to control fuel buildup in woodlands and forests and alter vegetation patterns (i.e., improve pastureland). This session brings together researchers to describe their work and findings in a setting conducive to discussion, debate, and sharing of information.

BENSON, Arlene  
Humboldt-Toiyabe National Forest  
*Effects of Fire on Obsidian Hydration Ring Thickness*



In September 1996, ninety obsidian samples were treated to low, moderate, and high intensity fire during a prescribed fire in a high mountain sagebrush environment. Thermocouples were used to record maximum temperatures reached at each sample during the burn. Ten control samples were not treated to fire. The obsidian hydration rinds of all 100 samples included in the study were measured before and after the study. Changes in hydration rind thickness of both treated and untreated obsidian samples will be described and implications discussed.

DEAL, Krista

McLEMORE, Denise

Eldorado National Forest

*Effects of Prescribed Burning on Obsidian and Implications for Reconstructing Past Landscape Conditions*

Hydration bands on surface and near-surface obsidian often become diffused and unreadable following wildfires. The assumption has been that less intense fires, like those prescribed for management purposes, do not reach temperatures that would affect hydration bands, although there has been little data to support this assumption. The current study measured the effects to archaeological obsidian of both temperature and duration of heat in two prescribed burns with differing fuel loads. Preliminary results indicated that duration of exposure to heat, even at low temperatures, creates effects on hydration bands similar to those of elevated temperatures. These results have potential implication for expanding fire histories beyond the 400-year limit of tree-coring, for reconstructing prior landscape conditions and Indian burning practices, for archaeological interpretations, and for cultural resource and ecosystem management.

GREEN, Dee

Warner Mountain Ranger District, USDA Forest Service

*Re-Hydrated Obsidian Projectile Points on the Warner Mountains, California*

Fire is the only known method, in the natural environment, which can remove hydration rinds from obsidian. In cases where early archaic projectile points show hydration rinds which reflect what is thought to be a much later time period, there is a probability that such points have been subjected to fire and then re-hydrated. This paper examines a

collection of such points from the Warner Mountains of northeastern California. Distributions of all hydrated points, by watershed, are examined and plotted. The utility of re-hydrated points in studies of fire history is examined.

HALFORD, F. Kirk

HALFORD, Anne S.

Bureau of Land Management

*The Trench Canyon Prescribed Burn: An Analysis of Fire Effects on Archaeological Resources within the Sagebrush Steppe Community*

Prescribed fire is becoming a common tool on Public Lands to manage fire behavior, fuel loading, and vegetation community association. The effects of this management practice on archaeological resources is of concern. This paper will focus on the effects of a prescribed burn on the hydration birefringent rim of obsidian artifacts. In particular, this analysis addresses the differential effects of fire within three quantified fuel zones within late seral Great Basin sage (*Artemisia tridentata* spp. *tridentata*) and upland sagebrush steppe community types.

KELLY, Roger

National Park Service

*An Overview of Obsidian Studies within NPS Park Projects*

From clumsy field experiments to higher-tech laboratory efforts, National Park Service archeological staff have explored heat effects upon obsidian for nearly two decades. Early assumptions and guesses have led to systematic and organized data collecting, but mostly post-prescription burns or post-wildfire campaigns. What have we – as one agency – learned about changes or lack of change in obsidian materials as found within several California NPS park units? And also, what about the neighboring NPS park units elsewhere in the West where comparative data exist? Are we working better with our fire program colleagues as a result of greater understanding about obsidian and fire?

LOYD, Janine

Sonoma State University Obsidian Laboratory

*Rehydration of Burned Obsidian*

Obsidian specimens have, no doubt, been exposed to fire during prehistoric and historic times, sometimes deliberately, but most often unintentionally as in the case of wildfires. Three

basic questions present themselves when looking at the effects of obsidian have been exposed to fire. Does obsidian lose hydration when it is burned? Does obsidian have the ability to rehydrate after it has been exposed to fire? Does the temperature at which the obsidian was burned affect obsidian rehydration? This paper presents the results of experiments designed to address these questions.

SCHRODER, Sue-Ann

Sonoma State University Obsidian Laboratory  
*A Synthesis of Previous Studies that Explored the Effects of Fire on Obsidian: Where We've Been and Where We're Going*

Some 15 unpublished and published documents related to fire/heat effects on obsidian were reviewed. Virtually each document described a different set of procedures that were used to determine whether fire/heat had affected hydration bands. The broad range of study procedures resulted in a shared conclusion—hydration bands were affected by fire/heat in some way. This paper will synthesize and describe analytical techniques and results of prior studies, with the intent of creating a solid foundation upon which future studies can be designed.

SHACKLEY, M. Steven

Archaeological XRF Laboratory, Phoebe Hearst Museum of Anthropology, University of California, Berkeley

DILLIAN, Carolyn

*Thermal and Environmental Effects on Obsidian Geochemistry: Experimental and Archaeological Evidence*

Recent EDXRF compositional studies of thermally altered archaeological obsidian from a number of late period sites in New Mexico and Arizona suggested that extreme thermal alteration may have been responsible for the depletion of elemental concentrations in the mid-Z x-ray region; a region where the most sensitive incompatible elements for the discrimination of archaeological obsidians reside. A stepped heating experiment subjecting samples of peraluminous to peralkaline artifact-quality obsidian to temperatures between 500°C and 1080°C indicated that at temperatures over 1000°C extreme mechanical changes occur, but the elemental composition in the mid-Z region does

not vary beyond that expected in typical instrumental error. It appears that the apparent depletion of elemental concentrations in the archaeological specimens is due to EDXRF analysis of surface regions where melted sands bonded to the surface glass are incorporated into the results. If accurate analyses of burned obsidian artifacts are desired, the layer of melted sand from the depositional contexts must be removed before analysis.

SIEFKIN, Nelson

National Park Service, Redwood National and State Parks

*Manual Fuel Load Reduction as a Means of Reducing the Effects of Fire on Obsidian Hydration: An Example from Lassen Volcanic National Park*

Each of the four National Park Service Units of northern California—Lassen Volcanic National Park, Lava Beds National Monument, Redwood National Park, and the Whiskeytown National Recreation Area—have prescribed fire programs which are conducted in areas with radically different vegetation types. As a result, the archaeological survey strategy and the assumptions about the effects of fire on obsidian (and other cultural resources), in each unit, differ, as do the protective measures for these resources. In 1998, National Park Service and California Department of Forestry personnel removed a substantial amount of dead and down woody fuel from the surface of a large lithic scatter in Lassen Volcanic. In the absence of funds for obsidian hydration, subsurface testing, and other studies, manual fuel load reduction may be a viable means of protecting obsidian from the effects of high temperature controlled burns and wildfires.

SKINNER, Carl N.

USFS, Pacific Southwest Research Station

Weatherspoon, C. Phillip

*Fire Regimes and Fire History: Implications for Obsidian Hydration Dating*

That fire can alter the hydration bands of obsidian specimens and thus affect the accuracy of dating is well known. It is also well known that before the 20<sup>th</sup> century, fires were generally frequent (intervals of 5-20 yrs were common) in most forest, woodland, grassland, and shrub ecosystems of the western U.S. and especially California. Thus it is

likely that obsidian material that has been unprotected for more than a few decades on or near the soil surface has been exposed to fire. Only material that was buried and remained so after it was no longer used is likely to have escaped being influenced by fire. Fire intensity and duration of burning are highly variable and dependent upon the nature of the available fuels and weather conditions. Thus, high variability in dates inferred from hydration rinds should be expected from artifacts that have been exposed to the effects of past fires.

SMITH, Jim

California Department of Forestry and Fire Protection

*Protecting Archeological Sites with Prescribed Fire*

Past fire studies have shown that fire has a measurable effect on the hydration rind that forms on obsidian artifacts. Ecosystem management requires the reintroduction of fire through either prescribed fires or to allow wildfires to burn unabated. Wildfires are happenstance, and when occurring in areas where significant archeological resources are located, damage to sites can occur not only through suppression actions but from the unnatural fire intensities generated from accumulated fuel loading attributed to successful fire management practices. Wildfires therefore, do not afford the opportunity for archaeologists to successfully protect known and newly discovered sites. Prescribed fire, through proper planning and site surveys, can protect archeological resources and allow the reintroduction of fires as a natural process in fire dependent ecosystems.

SOLOMON, Madeline

Sonoma State University and California Department of Forestry and Fire Protection

*Fire and Glass: Experimental Approaches to Understanding the Effects of Prescribed Burning on Obsidian Hydration Bands*

During field experiments conducted in spring 1998 at Boggs Mountain Demonstration State Forest in Lake County, California, the hydration bands on obsidian artifacts placed in ground surface and subsurface contexts were not affected by exposure to prescribed burn conditions. Subsequent laboratory experiments at Sonoma State University suggested that hydration bands may not be affected by prolonged exposures (24 hours) to temperatures of 100°C or below. These findings are considered in

light of previous research on the effects of prescribed fire on obsidian hydration bands, and it is suggested that an examination of the specific prescription involved in a proposed burn is an essential factor in determining the likelihood that hydration bands may become damaged during prescription burning. As additional studies are needed to expand and refine our understanding of the effects of fire on hydration bands, several experimental approaches are proposed and discussed.

STEFFEN, Anastasia

University of New Mexico

*The Dome Fire Study: Extreme Forest Fire Effects on Jemez Obsidian*

The 1996 Dome Fire burned over several obsidian source locations in the Jemez Mountains of northern New Mexico. At one site, Capulin Quarry, the effects of the wildfire on obsidian were remarkably severe – including artifact bubbling, bloating, and complete destruction through vesiculation. This paper presents these effects along with an exploration of why obsidian at this source (Rabbit Mountain / Cerro Toledo rhyolite) had such a volatile response during this forest fire.

[Editor's Note: The Effects of Fire/Heat symposium, held all Friday afternoon and Saturday morning at the SCA Annual Meeting, was very well attended and enthusiastically received. We hope to print one or more of the excellent papers in an upcoming issue.]

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*Prehistoric Use of the Coso Volcanic Field.* Amy J. Gilreath and William R. Hildebrandt. Contributions of the California Archaeological Research Facility No. 56, 1997, x +202 pp., 12 maps, 26 figures, 9 plates, 87 tables, \$25.95 (paper).

A review of the above monograph by David Rhode, Quaternary Sciences Center, Desert Research Institute, Reno, Nevada, appears in the most recent issue of the *Journal of California and Great Basin Anthropology* 20(2):285-289. Read the review, then visit the UCARF website for ordering information: <http://www.qal.berkeley.edu/arf>

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## Minutes of the IAOS Annual Meeting

The 11<sup>th</sup> Annual Meeting of the IAOS was held at the Sheraton Chicago Hotel and Towers on Thursday afternoon, 25 March 1999, in conjunction with the 64<sup>th</sup> Annual Meeting of the Society for American Archaeology. Eleven members attended.

The meeting was called to order by Secretary-Treasurer Pat Dunning because President Dave Fredrickson was, unfortunately, unable to attend. Pat briefly covered the IAOS accomplishments of the past year, under Dave's leadership and with Suzanne Stewart's able editorship of the *Bulletin*. Suzanne has agreed to do two more issues, giving us time to find someone to take over. Dave Fredrickson offered two suggestions: that the President's term be lengthened to two years – he felt he finally understood the job just as his term was ending – and that perhaps we would be better served by two "fat" newsletters per year, rather than the three we are publishing now. Pat then passed the gavel to Geoffrey Braswell, IAOS President for the 1999-2000 fiscal year.

Geoffrey made four suggestions in his opening statement: (1) We could increase IAOS involvement and

membership if each of us would approach colleagues in archaeology and other fields whom we know are not members. (2) We should try to widen our (unofficial) focus beyond obsidian hydration dating and source provenience to other aspects of obsidian studies. (3) Building on the groundwork already set by the Association, we should sponsor obsidian sessions at the SAAs and other national meetings. (4) We also should increase our regional presence: the combined IAOS and Society for California Archaeology obsidian sessions at this year's SCA are a good start, and Geoff hopes that next year's State University of New York – Buffalo's archaeometry conference could serve the same purpose in the East. Geoff also thanked Dave Fredrickson, Pat Dunning, and Suzanne Stewart for their years of dedicated service and announced he had found two graduate students who had agreed to take over as editors of the *Bulletin*: Bill McFarlane (SUNY-Buffalo) and Carleen Sanchez (UC Santa Barbara).

Pat Dunning announced the election results. E. Michael Elam was elected President-Elect in a very close race, and Michael A. Gottesman was elected Secretary-Treasurer, almost unanimously.

### IAOS INCOME AND EXPENSE REPORT

	1998-9	1997-8	1996-7	1995-6	1994-5
<b>Income</b>					
Membership Dues	2060.00	2364.18	1835.09	1800.00	1380.00
Reprints, Biblio		20.00			20.00
Donations		50.00	30.00		
Interest	55.38	61.24	40.45	36.65	28.28
<b>Total</b>	<b>2115.38</b>	<b>2495.42</b>	<b>1905.54</b>	<b>1836.65</b>	<b>1428.28</b>
<b>Expense</b>					
Newsletter	410.23	267.59	338.84	611.99	221.21
Printing		69.52			
Postage	305.61	306.47	366.67	477.29	230.97
Office Expenses	83.00	69.17	45.70	63.88	46.16
Bank Service Chgs	4.00	14.00	3.00	-10.00	96.00
Honorarium		500.00			
Meeting Expense					265.07
<b>Total</b>	<b>802.84</b>	<b>1226.75</b>	<b>754.21</b>	<b>1143.16</b>	<b>859.41</b>
Net	1312.54	1268.67	1151.33	693.49	568.87
<b>YE Balance</b>	<b>7570.35</b>	<b>6257.81</b>	<b>4989.14</b>	<b>3837.81</b>	<b>3144.32</b>
<b>Members</b>	94	99	100	114	
International	15	13	12	15	14
New	12	13	4	7	14
Life	20	17	12	10	8
Checking Balance	4421.71	3164.55	1957.12	646.86	9/18/96
Savings Balance	3148.64	3093.26	3032.02	3000.00	

## IAOS Minutes - 25 March 1999, contd.

Pat also provided an update on our financial situation [see page 2 of this issue for financial report]. Our 31 March 1999 bank balance was \$7570.35, an increase of \$1312.54 over last year. However, \$1100 of that increase comes from four new life members – three individuals, plus the University of Auckland, which paid \$500 for an institutional life membership.

Our income for the year totaled \$2115.38, comprised of \$2060 from membership dues and \$55.38 from interest. Expenses totaled \$802.84; 89% went for printing and mailing the newsletter [\$410 and \$306, respectively], most of the rest for buying the gavel which Jon Ericson gave to Dave Fredrickson last year, and which was passed to Geoffrey Braswell this year. As of March 31, 1999 we had 94 members. Fifteen were international, 15 were students, and 20 were life members.

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Geoff requested nominations from the floor for next year's IAOS officers. Andy Darling was nominated and seconded for President-elect. There were no other nominations.

The meeting attendees discussed Dave's suggestion that we extend the term of President from one to two years, and all agreed that it was a good idea. It was also agreed that the President and Secretary-Treasurer's terms should be offset, to provide better continuity. Pat Dunning agreed to initiate the bylaws change required and submit it to the membership.

Pat Dunning mentioned that when dropping a member for non-payment of dues, she sends a letter asking why the Association had not met expectations. Someone finally responded – he was interested in hydration rate studies, while most recent *Bulletin* articles relate to sourcing studies. Pat asked that we try to increase our *Bulletin* submissions in that area.

The Obsidian Bibliography, last updated in October 1993, was discussed. Craig Skinner has no intention of updating the diskette-based version, but may eventually

update the version on the web. Mike Glascock mentioned that there is a way, on the web site, to submit abstracts to update the on-line bibliography. He admitted that he had submitted only a few under this system. Pat Dunning agreed to investigate this possibility, and to at least submit those abstracts which have appeared in the *Bulletin* since the bibliography was last updated.

Robert Tykot passed out a copy of a recent Society for Archaeological Sciences Bulletin, to IAOS members who were not SAS members.

Mike Gottesman briefly discussed the work the UCLA Obsidian Lab has been doing [see his article in this issue of the *Bulletin*]. He also indicated his intent to increase IAOS membership from the Geoarchaeology interest group meeting at the SAA, this year scheduled immediately after ours.

The following members attended the annual meeting: Geoff Braswell, John Cook, Andy Darling, Pat Dunning, Mike Glascock, Mike Gottesman, Helen Haines, Carleen Sanchez, Chris Stevenson, Robert Tykot.

Respectfully submitted,

Patricia A. Dunning

### NEW IAOS MEMBERS

The following people have joined the IAOS since the last issue of the *Bulletin*; they are listed with current residence and affiliation:

Daniel Camboia, Sacramento, CA; Archaeological Resource Center, California State University, Sacramento

Edward Christensen, Salt Lake City; graduate student, University of Utah

Carolyn Dillian, Walnut Creek, CA; University of California, Berkeley

Jelmer Eerkens, Santa Barbara; University of California, Santa Barbara

Helen R. Haines, Scarborough, Canada; Institute of Archaeology, London, UK

William J. McFarlane, Buffalo, NY; SUNY-Buffalo

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## CALENDAR OF EVENTS

19-20 February 2000 - Archaeometry Conference at SUNY-Buffalo. Details to be announced.

5-9 April 2000 - 65<sup>th</sup> Annual Meeting of the Society for American Archaeology, Philadelphia.

19-22 April 2000 - 34<sup>th</sup> Annual Meeting of the Society for California Archaeology, Riverside, California.

Get your events added to the calendar listings by dropping an e-mail note to the editor.

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## ABOUT THE IAOS

The IAOS was established to:

1. develop standards for analytic procedures and ensure inter-laboratory comparability;
2. develop standards for recording and reporting obsidian hydration and characterization results;
3. provide technical support in the form of training and workshops for those wanting to develop their expertise in the field, and;
4. provide a central source of information regarding the advances in obsidian studies and the analytic capabilities of various laboratories and institutions.

### Membership

The IAOS needs membership to ensure success of the organization. To be included as a member and receive all of the benefits thereof, you may apply for membership in one of the following categories:

- Regular member \$20.00/year
- Institutional member \$50.00
- Student member \$10.00/year or free with submission of paper to newsletter and copy of current student identification
- Life-Time Member \$200.00

Regular members are individuals or institutions who are interested in obsidian studies, and wish to support the goals of the IAOS. Regular members will receive any general mailings; announcements of meetings, conferences, and symposia; bulletins; and papers distributed by the IAOS during the year. Regular members are entitled to attend and vote in Annual Meetings.

Institutional members are those individuals, facilities, and institutions who are active in obsidian studies and wish to participate in inter-laboratory comparisons and standardization. If an institution joins, all members of that institution are listed as IAOS members, although they will receive only one mailing per institution. Institutional members will receive assistance from, or be able to collaborate with, other institutional members. Institutional members are automatically on the Executive Board, and as such have greater influence on the goals and activities of the IAOS.

\*Membership fee may be reduced and/or waived in cases of financial hardship or difficulty in paying in foreign currency. Please complete the form and return to the Secretary-Treasurer with a short explanation regarding lack of payment.

\*\*Because membership fees are very low, the IAOS asks that all payments be made in US dollars in international money orders or checks payable on a bank with a US branch. If you do not do so, much of your dues are spent in currency exchange. If you wish to join us, mail a check or money order to the IAOS: Michael Gottesman, Secy-Treas., 4921 Arvada Street, Torrance CA 90503.

## CALL FOR ARTICLES AND INFORMATION

Submissions of articles, short reports, abstracts, or announcements for inclusion in the newsletter are always welcome. We accept electronic media on IBM-compatible diskettes in a variety of word-processing formats, but WordPerfect (up to 8.0) or Word 97 is preferred. A hard copy of the text and any figures should accompany diskettes. (Contributions may also be e-mailed, by prior arrangement; see below.)

Deadline for the Fall *Bulletin* is 15 September 1999.

Send submissions to –

Suzanne Stewart  
IAOS Bulletin Editor  
Anthropological Studies Center, Bldg. 29  
Sonoma State University  
Rohnert Park, CA 94928

To send short contributions, discuss article ideas, or make suggestions, please get in touch by e-mail: [stewart@sonic.net](mailto:stewart@sonic.net).

Our new editors will take over after the September issue. Talk to William McFarlane about ideas for future issues: 380 MCFAC/Ellicott Complex, SUNY-Buffalo, Amherst NY 14261.

# INTERNATIONAL ASSOCIATION FOR OBSIDIAN STUDIES

## ◆ Membership Application ◆

Yes, I'd like to renew my membership. A check or money order for the annual membership fee is enclosed (see below).

Yes, I'd like to become a member of IAOS. A check or money order for the annual membership fee is enclosed (see below). Please send my first issue of the IAOS Bulletin and a copy of the diskette-based (IBM PC-compatible) IAOS Obsidian Bibliography. Please check disk format required:  5 1/4 360 KB or  3 1/2 1.44 MB.

I am a student (copy of ID enclosed) and I am enclosing an abstract for a published obsidian related article or submitting a paper to the IAOS for printing in the Bulletin. Please enter my free membership. Please send the bibliography on  5 1/4 360 KB or  3 1/2 1.44 MB diskette.

Not convinced, but want to know more?

Please send me a complimentary issue of the latest IAOS Bulletin.

Please send me a copy of the IAOS Obsidian Bibliography ( 5 1/4 or  3 1/2) and a complimentary copy of the IAOS Bulletin. My check or money order for \$10 (refundable if I join IAOS this calendar year) is enclosed.

Name \_\_\_\_\_

Title \_\_\_\_\_

Street Address \_\_\_\_\_

City, State, Zip \_\_\_\_\_

Country \_\_\_\_\_

Affiliation \_\_\_\_\_

Work Phone \_\_\_\_\_ FAX # \_\_\_\_\_

Home Phone (optional) \_\_\_\_\_

E-Mail Address(es) \_\_\_\_\_

My check or money order is enclosed for the following amount (please check one):

\$10 Student (submit ID)

\$20 Regular Member

\$50 Institutional Member

\$200 Lifetime Member

Please return this application to :

IAOS

M. Gottesman

4921 Arvada St.

Torrance, CA 90503-1413