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Assembled and edited by B. Hamusek

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NEWS AND INFORMATION

THE IAOS ANNUAL MEETING

The IAOS will hold its 7th Annual Meeting on Friday, May 5, 1995, at 4:30 pm at the Minneapolis Hilton and Towers in Minneapolis, Minnesota. This meeting will be held in conjunction with the upcoming 60th Annual Meeting of the Society for American Archaeology.

The 90 minute meeting is being organized by Dr. Michael Glascock, who emphasized that a *short* business meeting will be followed by a workshop and discussion regarding the compilation of a comprehensive "Obsidian Descriptive Geochemical and Literature Database".

Glascock's plan is to create an informational database that can be made available to all interested obsidian researchers throughout the "world". Additional information concerning this worldwide

obsidian catalog can be found in the previous IAOS newsletter (Summer 1994 - Newsletter 12; Page 2). If you are interested in assisting with this database, or would like a copy of the final product, plan to attend the "IAOS Meeting and Workshop on Obsidian Descriptive Geochemical and Literature Database" on May 5, 1995. Details on the meeting's location will be found at the SAA Information Booth.

SOCIETY FOR AMERICAN ARCHAEOLOGY SYMPOSIUM

A number of papers relevant to obsidian hydration analysis will be presented on May 5, 1995 at the 60th Annual Meeting of the Society for American Archaeology in Minneapolis, Minnesota. Todd L. VanPool and Christine VanPool are the organizers of the symposium entitled "Understanding Obsidian Hydration Dating: Recent Methodological and Experimental Advances". Participants include R. Reanier, F.J. Bove, H. Neff, A. Freter, R. Ridings, D. Rhode, C. Stevenson, P.J. Sheppard, and D.G. Sutton. The discussant will be P. Shelley. The goals of the symposium are two fold: 1) to present recent research concerning the chemical and environmental factors influencing the rate of hydration rind formation, and 2) to present innovative methodological advances in applying obsidian hydration dating.

SCIENCE AND ARCHAEOLOGY: TOWARDS AN INTERDISCIPLINARY PAST

A conference entitled "Science and Archaeology: Towards an Interdisciplinary Past" was recently held at Harvard University, Cambridge, Massachusetts on October 14-16, 1994. Approximately 110 people from 8 countries attended this conference which was organized by Drs. Robert H. Tykot and Geoffrey D. Purcell. Included among the various presentations were several papers related to obsidian studies. The

abstracts from those poster presentations are included below:

Non-Destructive Sourcing of Old World Obsidians
by P. Kayani, M. Pollard, and G. McDonnell
(Department of Archaeological Sciences, University of
Bradford, Bradford, BD71DP, United Kingdom) and S.
Fleming (Museum Applied Science Center for
Archaeology, The University Museum, University of
Pennsylvania, Philadelphia, PA 19104, USA)

Following successful programs of obsidian research sourcing by INAA at the Department of Archaeological Sciences, a joint Bradford-MASCA program on methods of non-destructive analysis of artifacts was initiated. This paper presented the results of analysis of the large corpus of Old World obsidians held at the Department using SEM-EDAX, Backscattered Electron (BSE) petrography and PIXE analysis and compared to the INAA dataset.

The Source of Corsica Obsidian: Provenience Analysis Based on Major Element Chemistry
by Robert H. Tykot and Karen Hartshorn
(Archaeometry Laboratories, Department of Anthropology,
Harvard University, Cambridge, MA 02138, USA)

The concentrations of the bulk elements silicon, aluminum, iron, magnesium, calcium, sodium, potassium, and titanium are sufficient to discriminate all sources of obsidian in the Mediterranean. Geological specimens, as well as several hundred obsidian artifacts from neolithic sites in Corsica, have been analyzed by wavelength-dispersive spectrometry using the electron microprobe. Simple bivariate plots discriminate between the main sources of Melos, Lipari, Pantelleria, Palmarola, and Monte Arci (Sardinia), while multivariate step-wise discriminant analysis can confidently assign samples to individual flows from Monte Arci and Pantelleria.

The analysis of 200 samples from 9 stratigraphic levels at Basi (Serra-di-Ferro) represents the largest study ever of obsidian exploitation at any one site in the western Mediterranean, and is singularly important for assessing chronological variation in obsidian exploitation. Our results contradict interpretations based on earlier studies of small numbers of Corsican samples, and indicate that obsidian from five Sardinian sources was utilized. Changing procurement mechanisms may account for differences between the Early and Late Neolithic periods.

IAOS OBSIDIAN BIBLIOGRAPHY HITS INTERNET HYPERSPACE ON THE WORLD WIDE WEB

by Craig Skinner

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For those of you lucky or persistent enough to have Internet access, I have some good news for you on the availability of obsidian-related resources. Jonathan Lizee, co-developer of ArchNet, a World Wide Web site for archaeology on the Internet located at the University of Connecticut, has recently volunteered to place the IAOS Obsidian

Bibliography on the Web as a searchable online document. The bibliographic resources will be interactively available worldwide from any Internet location. ArchNet also recently featured the IAOS and the availability of the IAOS Obsidian Bibliography at their site.

RECENT DEVELOPMENT

10/29/94

A searchable database of references for obsidian studies is now available as a zip file (339k compressed zip file/1.1M uncompressed). The Obsidian Bibliography by Craig Skinner (INFOTEC, Inc) and Kim Tremaine (UC, Davis) is a DOS based program which includes references in ASCII format and a built-in search engine. Originally published by the International Association for Obsidian Studies (IAOS) 10/93. A very useful resource for lithic analysis. ArchNet plans to convert this bibliography to a searchable on-line database in the near future.

The Arch Net announcement includes a short description of the IAOS along with membership information. This Internet site is accessed several thousand times a day by users from at least 45 countries and is an excellent Internet resource for archaeological information.

ArchNet access via WWW is:

<http://spirit.lib.uconn.edu/ArchNet/ArchNet.html>.

My thanks to Mike Rondeau for initially making the ArchNet folks aware of the IAOS Bibliography.

A Word on the World Wide Web

The World Wide Web (WWW) is one of the most active areas of development on the Internet and is currently experiencing a period of explosive growth. Started in only 1990, the WWW has grown from about 50 sites in January of 1993 to an estimated 10,000 sites at the present time.

WWW works through electronic documents that are connected by hypertext links. Although the hypertext links are written into the documents using a simple page description language (HTML), they are seen to a user only as underlined or otherwise emphasized words, phrases, or images. These documents are viewed by special browsers that range in complexity from text only to full graphical interfaces with mouse and multimedia support. By selecting the hypertext links, the user moves from one electronic page to another. The pages appear to be directly connected (like moving from one page to another in a book) but may actually be scattered at multiple Internet sites worldwide. WWW users begin at a *home page*, the first page at a site, and then follow the links to other pages or Internet sites. The amount of information now accessible on the Web is, even at this early date in its development, truly astounding.

A detailed description of the WWW is beyond the scope of this brief article. If you're interested in learning more about the Web or about how to get access, I'd suggest that you take a look at the increasingly plentiful Internet book section in the computer section of almost any bookstore.

The Future Is Here Now: Trust Me On This One

I can guarantee that you'll be hearing much more about the WWW in the near future. As access to the Internet is opened up and graphical, easy-to-use browsers make their way to the surface, use of WWW resources will be greatly simplified. Multimedia Internet WWW browsers such as Mosaic, Cello, or NetScape, are Windows programs with point and click style ease of use. Combined

text, graphics, sound, and video will be at your fingertips provided you have a very fast modem or a direct link to the Internet (such as is available at most universities).

It's admittedly hard to visualize the appeal of the WWW until you've seen it in action. As Jonathan Lizée so succinctly described it in a recent e-mail conversation: "... it doesn't make sense to people until they SEE IT. Then it's like seeing fire for the first time." This is the closest thing that you're likely to see to the much-publicized *Information Superhighway* in the near future, too, and I recommend that you explore the Web at the first available opportunity.

An IAOS WWW Site for the Future?

I didn't want the IAOS to be left in the Internet dust and so plans are afoot to establish an IAOS WWW home page at Oregon State University. Although the development of an IAOS site is still in its very early stages, I do have a draft home page up-and-running (see back cover). The home page will provide links to information about the IAOS and obsidian-related resources, articles and abstracts from the *IAOS Bulletin*, and announcements about archaeological projects. It will also provide connections to other Internet locations that may be of interest (e.g., archaeology Internet sites, GIS and mapping sites, geology sites, and so on).

Development will take several months with a projected appearance on the Internet sometime in 1995. An example of the WWW Site Outline is provided on an attached colored sheet for your perusal. If you have any ideas about what kind of resources you would like to have available, I'm open to any suggestions. In the meantime, happy net surfing.

A note on the current provenience of the bibliography authors: Since we finished the bibliography in late 1993, both Kim and I have shifted affiliations. I am now busy at microcomputer and archaeology contract work (currently for the Center for the Study of the First Americans, Oregon State University) under the guise of Northwest Research. Kim has once again retreated to the university cloister and is working on her Ph.D. at the University of California, Davis.

SHORT REPORTS & REVIEWS

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Short Reports & Reviews provides an archaeological context in which to report obsidian research and related information. Reviews of recent studies, research in progress, older findings, regional, site, and artifact specific summaries, as well as other reports, announcements, etc. of pertinent interest are encouraged. To submit contributions to Short Reports or for an outline of recommended archaeological/obsidian information for the Short Reports format contact Mike Rondeau.

WORK IN WESTERN GUATEMALA

Research under the direction of Michael Love in three departments of the Pacific Coast region of Guatemala has located over 200 archaeological sites and led to the excavation of the small city of La Blanca which covers about two square kilometers. Both the Middle and Late Preclassic periods are represented. The temporal range covers ca. 900 to 100 B.C. involving the Conchas, Caramelo, and Crucero Phases.

Obsidian dominates the flaked stone with about five percent being chert and only a trace of basalt. Six sources for the obsidian have been identified. The three major glass types are El Chayal, Ixtepeque, and San Martin Jilotepeque. The three minor ones include Tajumulco and two as yet unlocated sources. The trace element analysis was conducted by Tom Jackson.

Much of the obsidian occurs in the form of prismatic blades. In the Late Preclassic prismatic blade cores are also found. Manufacturing of flakes by direct, hard hammer percussion and bipolar percussion were also identified. Projectile points are rare and almost no evidence of biface manufacture has thus far been unearthed.

Funding for this research has been provided in part by Fulbright Fellowships and grants from the National Science Foundation and Heinz Charitable Trust. Funding for future work is being supported by a grant from the Wenner-Gren Foundation. A field school through Sonoma State University was undertaken in January of 1995 to excavate at the urban center of Ujuxte which covers over four square kilometers. Sourcing and hydration studies for this stage of the research are to be provided by Hector Neff and Mike Glascock.

WYOMING, UTAH, NEVADA, AND CALIFORNIA - THE KERN RIVER PIPELINE PROJECT: SUMMARY REPORT

Archaeological excavations by Dames & Moore, Inc. beginning in 1991 and concluding in 1993 involved over 160 sites during the data recovery phase for that natural gas pipeline project.

The California segment of the project yielded obsidian from West Sugarloaf, Coso Volcanic Field, Government Mountain/Sitgreaves Peak, Bodie Hills, and several unknown sources. Many specimens exhibited diffuse hydration due to extreme weathering. Surviving hydration bands ranged from 7.2 to 14.6 microns. Hydration, radiocarbon, cation-ratio, and diagnostic artifact data indicated site representing the temporal periods of Lake Mojave (12,000-7,000 B.P.), Pinto (7,000-4,000 B.P.), Gypsum (4,000-1,500 B.P.), Saratoga Springs (1,500-750 B.P.) and the Protohistoric (post 750 B.P.). XRF analyses were conducted by Richard Hughes hydration studies by Kathleen Hull.

The Nevada segment crossed through southernmost Clark County. Wild Horse Canyon, Pumice Hole Mine and Coso obsidian were identified at the sites investigated in addition to volcanic glass from an unknown source. Hydration band widths ranged from 2.4 to 7.5 microns. Chronological data were found to represent Gypsum (4,000-1500 B.P.), Saratoga Springs (1500-750 B.P.), and the Protohistoric (post 750 B.P.) periods. Steven Shackley undertook the source ascription studies. Tom Origer and Kathleen Hull conducted the hydration analysis.

For Utah, two major obsidian source areas were transversed by the project. A total of 160 obsidian specimens from 124 sites were subjected to obsidian characterization analysis by Richard Hughes. XRF

International Association for Obsidian Studies (IAOS)
World Wide Web Site Outline
Last Revision: 11/21/94

IAOS: About the IAOS

Introductory information about the IAOS

A Short Introduction and Organizational Objectives

Short biographies on current officers and board of advisors - list
of past officers

IAOS Publications

IAOS Membership Summary

Summary by state and country

Membership directory

News, Projects, and Announcements

Summaries of research projects, gossip, etc. Many of these can be pulled from the IAOS Bulletin. Some Internet solicitation of research project descriptions might be effective.

The IAOS WWW Home Page: A Work in Progress

How to contact site coordinator

IAOS Calendar of Events

IAOS Annual Meeting News

Worldwide Obsidian Catalog: Plans and Progress

Newberry National Volcanic Monument Obsidian Project

PPT-PG&E Pipeline Project Obsidian Studies

Oregon Obsidian Reference Materials Project

Descriptions of any other major (or minor) projects

IAOS Bulletin Articles

Full text of all major IAOS Bulletin articles. Put all abstracted and summarized items on a single page (easiest)? Develop simple author and title indices. Could do black and white 300 dpi scans of all issues and have these available for downloading (instant back issues).

IAOS Bulletin No. 1

IAOS Bulletin No. 2

IAOS Bulletin No. 3

IAOS Bulletin No. 4

IAOS Bulletin No. 5

IAOS Bulletin No. 6

IAOS Bulletin No. 7

IAOS Bulletin No. 8

IAOS Bulletin No. 9

IAOS Bulletin No. 10

IAOS Bulletin No. 11

IAOS Bulletin No. 12

IAOS Bulletin No. 13

IAOS Bulletin Title Index

IAOS Bulletin Author Index

IAOS Bulletin Abstracts and Summaries

Submitting Articles to the IAOS Bulletin

Obsidian Resources

Resources specific to obsidian studies. Need to develop source lists, area bibliographies, and obsidian FAQ's. Compile all abstracts that have appeared in the Bulletin in a single viewable file. This is where most of the development work will go. Coordinate some of these with other area or method specialists.

IAOS Worldwide Obsidian Bibliography

Include description of bibliography, availability, and ArchNet
link

Area Obsidian Bibliographies

- Oregon [Almost complete]

- Other states or countries

IAOS Bulletin Abstracts and Summaries

Thesis and Dissertation Abstracts

- Full text abstracts from theses and dissertations along with scanned tables of contents

Tables of Contents

- Scanned contents for major obsidian-related books (e.g., Obsidian Studies in the Great Basin, Obsidian Dates I-IV, etc.)

Obsidian Source Catalogs and Databases

- Source lists: Region or World

- Oregon [Me]

- World [Glascock et al.]

Characterized Obsidian Artifact and Site Databases

- Characterized artifact databases

- Characterized site lists with summaries or results

Obsidian Characterization Studies Information (FAQ)

Obsidian Hydration Studies Information (FAQ)

Obsidian Source Studies Information (FAQ)

Obsidian Use-Wear and Technological Studies Information (FAQ)

Obsidian Characterization and Hydration Laboratories

- Separate page (including) questionnaire responses for each laboratory profiled in article

Obsidian Megascopic Description Terminology

Related Resources

Primarily pointers to related Internet resources along with a few documents and FAQ's converted to HTML information files.

- Anthropology/Archaeology Internet Resources FAQ

- Archaeology and Archaeological Science Resources

- Anthropology Resources

- Earth Science and Geoarchaeology Resources

- Statistics and Mathematics Resources

- Graphics Resources

- Miscellaneous Internet Resources

- Useful Software

- Web Surfing: Some of Our Other Favorite WWW Locations

- Center for the Study of the First Americans

- ArchNet

Obsidian-Related Images

Scanned color or black and white images of obsidian artifacts, sources, and so on. Could use .GIF thumbnails that could be viewed by most browsers but JPEG files for actual downloading to save computer space and download time.

- Obsidian Artifacts

- Obsidian Sources

- Other Images of Possible Interest

Topic Index

Alphabetical topic/name index for all hypertext links

FAQ = Frequently asked questions; a thorough but to-the-point document covering the basic elements of a topic, a list of frequently asked question, and essential resources. Commonly distributed on the Internet in association with many different interest.

studies identified Wild Horse Canyon, Panaca Summit/Modena Area, Black Rock Area, Topaz Mountain, Kane Spring, Black Mountain, White Mountain, Brown's Bench, Malad, and a variety of unknown sources. Hydration measurements were attempted on 2417 specimens by Kathleen Hull.

A total of 2266 specimens yielded measurable band widths, ranging from 0.9 to 11 microns. This information, combined with other temporal data suggest representation of Paleoindian (12,000-9,000 B.P.), Early Archaic (8,500-5,500 B.P.), Middle Archaic (5,500-3,500 B.P.), Late Archaic (3,500-2,000 B.P.), Formative (1,600-650 B.P.), and Paiute/Shoshoni (post 750 B.P.) periods. Tentative hydration rate formulas were developed for the Wild Horse Canyon/Black Rock Area and the Panaca Summit/Modena Area obsidian sources. Hydration data were used to discuss diachronic population patterns and their linkage to paleoenvironmental data from the study area.

Studies of the Wyoming segment yielded obsidian from the Malad, Chesterfield, McNeely Ranch, and Obsidian Cliff sources. Hydration data were not available at the time of this reporting. Richard Hughes again conducted the XRF analyses, while Tom Origer completed the band width analysis.

OBSIDIAN FLAKES AS FUNERARY ITEMS, ALAMEDA COUNTY, CALIFORNIA

Archaeological excavations between March and July of 1994 were conducted by Holman and Associates under the direction of Randy Wiberg at several sites in the Western Livermore/Amadore Valley system. These sites, CA-Ala-483 and CA-Ala-555, at an elevation of ca. 330 ft. were located along the edge of extinct Willow Marsh at the toe of Pleasanton Ridge.

Most of the archaeological materials and about 200 burials were recovered from CA-Ala-555. A vast majority of the artifacts, including groundstone and items manufactured from animal bone, were assigned to Phase I and early Phase II of the Augustine Pattern. Evidence of an earlier occupation, including traces of the Meganos Culture were also recovered.

Napa Valley obsidian was recovered from both burial and midden contexts. During late Phase I, glass was brought to the site mainly as larger obsidian flakes.

Their size and hydration range suggest that they were gathered from existing debris at the quarry/workshop locality about 70 miles to the north.

The obsidian was subjected to hydration studies for the purpose of addressing a series of research goals including (1) the temporal placement of the projectile points, the burials, obsidian use from both vertical and horizontal samples; (2) the timing of various flaking techniques including the manufacture of the larger flakes, their use as biface blanks, and as cores; and (3) testing for obsidian reuse. This latter research goal included the selection of ventral remnant flakes in a search for different hydration band widths between the remnant ventral surface of the original flake blank and the new flake's ventral face. Placement of the hydration cuts were based on a technological reading of the flakes scars.

The majority of band width measured between 2.0 and 0.9 microns. Double rims were found on a minority of the small serrated projectile points, other finished bifaces and preforms as well as ventral remnant flakes, and larger interior flakes. The thicker widths for those double band specimens ranged from 6.9 to 1.8 microns. The younger band widths on those same specimens ranged from 3.1 to 0.9 microns.

Numerous "large" obsidian flakes were found to have been laid on top of Burial 107 (at CA-Ala-555) during cremation. Many pieces shattered, but did not melt. After refitting the broken pieces, a minimum number of 11 interior and 56 cortical flakes were identified. Pieces that were not refitted included 48 interior and 54 cortical fragments. Band width measurements were taken on six specimens: 3.5, 3.0, 1.9, 1.7, 1.3, and 1.1 microns.

While larger obsidian flakes were included in some other burials, their numbers were limited. Obsidian bifaces and a range of other funerary items (e.g., mortars, pestles, shell beads, bone whistles/tubes) were also recovered from the interments at CA-Ala-555. The lithic technology was analyzed by Dave Bieling. The obsidian band width analysis was undertaken by Tom Origer and the XRF by Richard Hughes.



ABSTRACTS AND ANNOTATIONS ON REPORTS AND PUBLICATIONS

Compiled by Blossom Hamusek, Archaeological Research Program, Department of Anthropology, California State University, Chico, California, 95929-0400, USA; (916) 898-4360.

... with contributions by Michael Glascock

The volume of so-called "gray literature" in archaeology is staggering, making it difficult for researchers who are not "plugged-in" to contract or research archaeology of a certain region to hear of and gain access to reports. In addition, the proliferation and number of journals, and the interdisciplinary nature of obsidian and glass studies make it difficult to keep abreast of all relevant, current literature. The IAOS Bulletin will alert readers to some of this information by reproducing abstracts and summarizing literature that may be of particular interest to IAOS members.

Ataman, Kathryn

1994 Obsidian Source Utilization Patterns Along the Middle Humboldt. A paper presented at the 24th Biennial Meetings of the Great Basin Anthropological Conference, Elko, Nevada.

Abstract

Obsidian source data from artifacts excavated in the Middle Humboldt region of north-central Nevada are examined in terms of temporal, technological, and spatial variation. Obsidian sources utilized by the prehistoric visitors to the Tosawih Quarries, are confined north of the Humboldt River, while the hunters visiting Whirlwind Valley and the lower reaches of the Northern Shoshone Range used obsidian from a wider geographic area. These differences may reflect temporal focus, differential access to the Quarries, and or functional variation in the use of this exotic in two raw material-rich locales.

Ayers, Williams S. and Goles, Gordon G.

1994 Geochemical Characterization of Lithic Materials in Micronesia. A paper presented at the 59th Annual Meetings of the Society American Archaeology, Anaheim, California.

Abstract

A review of lithic material distributions from archaeological contexts in Micronesia shows significant evidence of long distance movement of stone raw materials and finished products. However, the lack of systematic geochemical characterization research limits detail regarding provenance; given the far reaching inter-island contacts known historically it should be possible to identify archaeological signatures in stone artifacts, even in atolls, with further study. The restricted range of stone material as a component of the technology suggests that in some areas ceramics may provide a more useful indicator of trade links. Specific evidence from Pohnpei area is discussed.

Bayham, Frank E., and Kathleen L. Hull

1994 Population Reconstruction via Calibrated Obsidian Hydration Rim Frequencies: An Example from the Eastern Great Basin. A paper presented at the 24th Biennial Meetings of the Great Basin Anthropological Conference, Elko, Nevada.

Abstract

Many aspects of the archaeological record are directly and indirectly influenced by population size. Yet, methods of reliably estimating population density are few. Although obsidian hydration rim width frequencies have been used to derive proxy estimates of local or regional population use through time, variable hydration rates and impaired temporal resolution have combined to limit its utility. Issues related to reconstructing estimates of regional population densities with obsidian hydration are examined, and a procedure is outlined which allows for temporal calibration of source specific rim width frequencies. Employing obsidians from two independent sources collected in the context of a linear transect through southwestern Utah, we propose a regionally specific population reconstruction spanning the last 11,000 years.

Bennett-Rogers, A., J. Fagan, and A. Farque

1994 From Quarry to Cache - Obsidian Procurement in the Central Cascades of Oregon. A paper presented at the 59th Annual Meetings of the Society for American Archaeology, Anaheim, California.

Abstract

The discovery of a biface cache consisting of numerous whole and fragmentary pieces precipitated a study of obsidian procurement and transport. The cache recovered from the western slopes of the Cascade Mountains in the Santiam River drainage was sourced to Obsidian Cliffs. Individual comparable biface artifacts have been recovered from archaeological sites in the area. This paper will describe the cache site and a study of the quarry site in relationship to a known trail system.

Cannon, Kenneth P. and Richard E. Hughes

1994 Emerging Patterns of Obsidian Utilization in Yellowstone National Park. A paper presented at the 59th Annual Meetings of the Society for American Archaeology, Anaheim, California.

Abstract

Although obsidian characterization studies have been prosecuted in the Yellowstone vicinity for nearly three decades the results, based on relatively small samples, indicated that only local sources were used. Recent studies have increased the sample size and support a new view of past obsidian exploitation. Contrary to previous work, our studies identified utilization of at least seven chemically distinct geologic sources (some over 280 km from Yellowstone), the use of which varied in frequency over the past 10,000 years. We discuss the patterning in these obsidian data insofar as they bear on models of regional settlement and lithic resource utilization.

Clark, Jeffrey and Elizabeth Wright

1994 Interactions Within and Beyond the Samoan Archipelago: Evidence from Basalt and Volcanic Glass Geochemistry. A paper presented at the Annual Meetings of the Society for American Archaeology, Anaheim, California.

Abstract

The islands of Samoa are critically important for understanding the prehistory of the Central Pacific. It has long been known that pre-historic Samoans had long-term socioeconomic interactions with the inhabitants of Tonga and Fiji. Only recently, however, have studies of basalt and volcanic glass geochemistry begun to reveal the antiquity, nature, and extent of those interactions. This paper summarizes the prehistoric interactions within the

Samoan group and between Samoa and other archipelagoes, as revealed through geochemical studies. Special attention is given to the role of Tutuila, in American Samoa, as a source for basalt and volcanic glass.

Doyle, David E.

1994 Production and Exchange of Obsidian Artifacts from the Gatlin Site, Southern Arizona. A paper presented at the 59th Annual Meetings of the Society for American Archaeology, Anaheim, California.

Abstract

Analysis of obsidian artifacts from the Gatlin Site (Arizona Z:2:1) using X-ray fluorescence (EDXRF) determined that most are from the nearby Saucedo source. While 15 percent of the total sample ($n = 75$) is made of non-local obsidian, 27 percent of the projectile points are of non-local materials, suggesting trade in finished points. Mobilization of resources through exchange may be indicated.

Glascok, M., R.L. Burger, and E. Salazar

1994 South American Obsidian Studies at the Missouri University Research Reactor. A paper presented at the 59th Annual Meetings of the Society for American Archaeology, Anaheim, California.

Abstract

The Archaeometry Laboratory at the Missouri University Research Reactor is assembling a database of obsidian source analyses for South America. Obsidian from sources and archaeological sites in the countries of Bolivia, Colombia, Ecuador, Peru, and Chile has been studied by neutron activation analysis. The complete analysis, which yields 27 elements, differentiates chemically similar sources. Source determination of artifacts is assisting archaeologists in understanding the movement of obsidian throughout the Andean region.

Glascok, M.D., H. Neff, K.S. Stryker, & T.N. Johnson

1994 Sourcing Archaeological Obsidian by an Abbreviated NAA Procedure. *Journal of Radioanalytical and Nuclear Chemistry, Articles* 180:29-35.

Abstract

An abbreviated NAA procedure has been developed to fingerprint obsidian artifacts in the Mesoamerican regions. Despite the large number of available sources, an NAA procedure, which relies on producing short-lived isotopes, has been applied with a success rate greater than 90 percent. The abbreviated NAA procedure is rapid and cost competitive with the XRF technique more often applied in obsidian sourcing. Results from the analysis of over 1,200 obsidian artifacts from throughout Mesoamerica are presented.

Glascok, M.D., H. Neff, J. Garcia-Barcena, and A. Pastrana

1994 La Obsidiana "Meca" del Centro de Mexico Analisis Quimico Y Petrografico. Travaux et Recherches dans les Amerique do Centre (TRACE) 25:66-74.

Abstract

Reddish-brown or "meca" obsidian constitutes only a very small fraction of the obsidian found at most of the sources in central Mexico. Although artifacts made from meca obsidian are uncommon, they have been excavated in numerous archaeological sites. Five specimens of meca obsidian from sources located in central Mexico were analyzed by neutron activation analysis at the Missouri University Research Reactor to determine how they might compare with the established chemical fingerprints for these sources. The most interesting observation from this project is that in spite of the great differences in color between the meca obsidian and the traditional colors for these sources, color did not greatly affect their chemical signatures. As a result, meca obsidian from central Mexico should be easily sourced by comparison with the chemical data currently available.

Gutierrez, Maria de la Luz and Justin R. Hyland

1994 First Report on the Proyecto Arte Repetire Sierra de San Francisco, Baja California Sur, Mexico. A paper presented at the 59th Annual Meetings of the Society for American Archaeology, Anaheim, California.

Abstract

The Proyecto Arte Rupestre Sierra de San Francisco, Baja California Sur, Mexico, one of the twelve Proyectos Especiales now being carried out by the

Instituto Nacional de Antropologia e Historia represents the largest archaeological project ever undertaken in Baja California. The goals of this two-year project are (1) the archaeological investigation of the famous Sierra de San Francisco painted murals and (2) the development of conservation strategies for the mural sites. Project accomplishments to date are reported, including: first AMS dates for the murals, the discovery of a new obsidian source, and evidence for Clovis occupation of central Baja California.

Hall, M.C. and Mark E. Basgall

1994 Casa Diablo Obsidian in California and Great Basin Prehistory. Paper presented at the 24th Biennial Meetings of the Great Basin Anthropological Conference, Elko, Nevada.

Abstract

Several decades of research have yielded various perspectives on use of obsidian from the Casa Diablo source in the eastern Sierra Nevada. Basic questions focus on the history of quarry production and technology, access to the toolstone locality, artifact discard at distant sites, regional subsistence-settlement patterns, and economic exchange. Newly compiled hydration measurement frequency curves for Casa Diablo artifacts from sites in the quarry area, and upper and lower western slopes of the central Sierra, are used to address these issues.

Hockett, Bryan Scott

1994 Caught in the Middle: Hydration Measurements of Pinto and Gatecliff Points and Implications for the Long/Short Chronology in Northeastern Nevada. A paper presented at the 24th Biennial Meetings of the Great Basin Anthropological Conference, Elko, Nevada.

Abstract

The proposed long and short chronologies of certain Great Basin projectile point styles has been debated for some time. It has been proposed that the short chronology is most applicable to the eastern Great Basin. Most of the northeastern Nevada lies between these two regions of the Basin. This paper discusses which chronological sequence may be most applicable to northeastern Nevada through an examination of morphological, spatial, and chronological projectile points recently recovered from Elko County.

Hughes, Richard E. and Craig E. Skinner
1994 Variability in Obsidian Source Use in Central Oregon. A paper presented at the 59th Annual Meetings of the Society for American Archaeology, Anaheim, California.

Abstract

The geologic source for more than 6,500 obsidian artifacts from 84 archaeological sites in the PGT-PG&E Pipeline Expansion Project have been determined using x-ray fluorescence spectrometry. Although numerous artifact-quality glass sources exist within the potential procurement spheres of these sites, only a limited number of these obsidians were extensively exploited prehistorically. In this paper, we examine the spatial distribution of obsidian from major sources and provide a preliminary assessment of diachronic and synchronic variability in source use as monitored by time-sensitive artifact types and obsidian hydration rim measurements.

Leach, Melinda
1994 Tracking the Ancients: Obsidian Transport and Population Movements in the Northwestern Great Basin. A paper presented at the 24th Biennial Meetings of the Great Basin Anthropological Conference, Elko, Nevada.

Abstract

Despite the availability of a rich obsidian source in the immediate proximity, northwestern Great Basin inhabitants of the Massacre Lake Basin exploited obsidian from other, often more distant source localities. No less than twelve obsidian sources are represented in collections from over 80 Massacre Lake Basin sites. Which sources were used, how intensively they were exploited, should be expected to vary over time as population movements, demographic changes, shifts in territory size and location, and changes in the general pattern of prehistoric land use occurred. The utility of obsidian sourcing and hydration data for informing about behavior, including mobility and raw material transport, will be assessed with data from the Massacre Lake Basin.

LeTourneau, Phillippe
1994 Recent Investigations at the Antelope Wells Obsidian Source, Animas Mountains, New Mexico. A paper presented at the 59th Annual

Meetings of the Society for American Archaeology, Anaheim, California.

Abstract

Antelope Wells obsidian from the Animas Mountains of southern New Mexico saw heavy prehistoric use. While the location of the primary source area for this volcanic glass is generally known, knowledge of the source material's geologic, physical, and chemical characteristics is limited. This report summarizes recent field work that contributes new information regarding geologic occurrence, surface density, chemical composition, and physical characteristics of the obsidian.

Olson, K. A., A. Ford, and M. Glascock
1994 Regional Exchange and Local Distribution: The Management and Meaning of Maya Obsidian in the Belize River Area. A paper presented at the 59th Annual Meetings of the Society for American Archaeology, Anaheim, California.

Abstract

Assumptions of centralized control over prestige goods are based on distributions of wealth and power inferred from settlement size and complexity. A good example is the Lowland Classic Maya obsidian trade. Throughout Mesoamerica, obsidian can be traced to highland sources that reveal long-distance connections in the Lowlands, the obsidian industry has been traditionally associated with civic-ceremonial centers. Clearly, the late Classic Maya elite effectively organized procurement, production and distribution of obsidian, yet the nature of centralized production has remained elusive. Data from the Belize River area present an alternative picture of decentralized control by elite in the hinterlands.

Pettigrew, Richard, and Craig Skinner
1994 Obsidian Hydration Studies in the Central Oregon Corridor: Results of the First Cut. A paper presented at the 59th Annual Meetings of the Society for American Archaeology, Anaheim, California.

Abstract

Over 6,500 obsidian artifacts from 84 central Oregon archaeological sites were chemically characterized and examined for obsidian hydration rims during the PGT-PG&E Pipeline Expansion Project. Carbon for radiocarbon determinations is often lacking and

obsidian hydration data often provide the only available chronometric avenue. This initial examination primarily addresses four topics: (1) relative hydration rates of different sources (using Mazama tephra as a temporal control); (2) preliminary calculated rates for several sources; (3) effects of sample size on hydration results and their implications in developing sampling strategies, and (4) anomalous hydration measurements associated with the 1350-year old Big Obsidian Flow in Newberry Caldera.

Rhode, David

1994 Obsidian Studies at Yucca Mountain, Nevada: Sourcing and Regional Chronology Development. A paper presented at the 59th Annual Meetings of the Society for American Archaeology, Anaheim, California.

Abstract

Obsidian artifacts from Yucca Mountain, Nevada, are used to examine diachronic regional patterns of artifact transport and chronology of landscape use. Eight known obsidian sources are represented: most obsidian was obtained locally, but some came from sources several hundred km distant. The greatest diversity of sources is from Early and Middle Archaic contexts; Late Archaic artifacts are almost exclusively locally derived. Chronology of regional landscape use is developed using obsidian hydration. An important constraint is the temporal resolution attainable by this method. Measurement of variables relevant to hydration rate allows estimation of the temporal resolution possible.

Rolett, Barry, Eric Conte, and Erik Pearthree

1994 Patterns and Processes of Prehistoric Marquesan Voyaging. A paper presented at the 59th Annual Meetings of the Society for American Archaeology, Anaheim, California.

Abstract

Located near the limits of human dispersal into the Pacific Ocean, the Marquesas are among the most geographically isolated islands in the world. Polynesian navigators eminently skilled in long-distance voyaging settled the Marquesas ca. 2000 B.P. but voyaging canoes and traditions had nearly vanished by Captain Cook's arrival in 1774. Prehistorians infer that voyaging spheres contacted through time but lack the archaeological evidence to

test this hypothesis. This study presents results for X-ray fluorescence analysis of lithic artifacts from recent excavations in the Marquesas, providing the first empirical data documenting processes and patterns of prehistoric interisland exchange.

Rondeau, Michael F.

1993 When Is An Elko? A paper presented at the Second Tulsa Conference on Theory In Lithic Analysis, Tulsa, Oklahoma.

Abstract

Perennial disagreements in the assignment of specific artifacts to point types and of types to temporal placement were seen as symbolized by the Flenniken-Thomas debate on the temporal utility of Great Basin projectile point types.

The study involved microscopic inspection of their technological attributes as well as obsidian source and hydration analyses. The technological inspection was concerned with reading the flake scars and related attributes to identify evidence for the influence of breakage and rejuvenation on the morphological stability of point forms.

It was concluded that detailed analyses of additional point collections to determine how forms actually changed would make the Flenniken-Thomas debate largely irrelevant. The influence of use breakage and rejuvenation on the gradual shift of projectile point mental templates and their resultant forms through time was hypothesized.

Schafer, David

1994 Above or Below Ground Research Designs? Examining the Obsidian Industry at Xaltocan. A paper presented at the 59th Annual Meetings of the Society for American Archaeology, Anaheim, California.

Abstract

Lithic data from extensive surface collections and stratigraphic test pits provide insights into some limitations and benefits of different data gathering methods. The obsidian industry of Xaltocan is examined for patterns and changes over time and through space. Lithic tool production and use are investigated and related to the larger economic and social changes that affected this community.

Schroth, Adella, and Robert M. Yohe II

1994 Obsidian Use and Technological Change in Rose Valley: Conclusions Based on the Analysis of Debitage from Two Sites. A paper presented at the 24th Biennial Meetings of the Great Basin Anthropological Conference, Elko, Nevada.

Abstract

A comprehensive obsidian debitage analysis of two important archaeological sites (Rose Spring and Stahl) in eastern California shows a significant change in lithic reduction strategies of locally obtained obsidians approximately 5,000 years ago. The technological analysis of the debitage used to define the two trajectories is summarized and the importance of the conclusions to our understanding of culture change through observed shifts in lithic technology is discussed.

Sheppard, Peter, and Robin Parker

1994 Lithic Raw Material Sourcing Studies in the Southern Cook Islands. A paper presented at the 59th Annual Meetings of the Society for American Archaeology, Anaheim, California.

Abstract

Results of a program of research on the sourcing of lithic materials used to manufacture adzes in the Southern Cook Islands is presented. This includes the characterization of stone from Rarotonga, Aitutaki, Atiu, Ma'uke and Mitiaro by thin section petrography and wavelength dispersive XRF and the analysis of similar means of samples taken from the adze collection of the Cook Islands Museum in Rarotonga. The implications of these analyses in respect of prehistoric inter-island voyaging is discussed.

Stevenson, C.M., and T.L. Jackson

1994 Estimation of Hydration Rates from Chemical Composition: A Case Example from Xaltocan, Mexico. A paper presented at the 59th Annual Meetings of the Society for American Archaeology, Anaheim, California.

Abstract

Recent research has demonstrated a strong relationship between the rate of hydration and hydroxyl (OH⁻) concentration contained within the obsidian. The ability of this calibration to provide accurate calendar dates was evaluated with ten

radiocarbon dated contexts from the Postclassic site of Xaltocan. Infrared spectroscopic analysis was used to determine the OH⁻ concentration of obsidian blades identified through x-ray fluorescence analysis as originating from the Pachuca source. Results of the IR analysis documented a small but significant variation in OH⁻ concentration. The chronometric obsidian dates from ten radiocarbon dated contexts showed good agreement with the C¹⁴ dates in five cases and supported the ability of current laboratory methods and calibrations to produce accurate calendar dates.

Torres, John A.

1994 The Juan Obsidian Quarry and Lithic Technology at Castle Mountains. A paper presented at the 24th Biennial Meetings of the Great Basin Anthropological Conference, Elko, Nevada.

Abstract

Many lithic reduction technologies were utilized throughout prehistory by the Mojave Desert people. Surviving in this arid environment provided many challenges for these resourceful people. Quarrying and raw material prospects were the primary means of lithic material acquisition of the many cherts, agates, and chalcedonies scattered throughout the Mojave Desert. In many parts of the Mojave Desert, there are patchy areas of obsidian clasts. The Juan Obsidian source is one such location. Juan Obsidian, like most of these obsidian clast sources, can only be reduced using the bipolar reduction technique. A technological analysis of the Juan Obsidian source can yield important information into the use of obsidian throughout the prehistory of the Mojave Desert.

VanPool, Todd, and Christine VanPool

1994 Solution pH and Obsidian Hydration Dating: An Experimental Study. A paper presented at the 59th Annual Meetings of the Society for American Archaeology, Anaheim, California.

Abstract

Obsidian hydration dating has assumed an increasingly important role in the construction of archaeological chronologies. However, several significant questions remain concerning the nature of the hydration process and factors that influence the rate of hydration. This paper reports the results

of an experimental study of the effect of solution pH on obsidian hydration rates. Specifically, obsidian from Glass Buttes, Oregon, has been hydrated in solutions ranging from pH 1 to pH 11. The results of these experiments and their implications for the archaeological use of obsidian hydration dating are examined.

Note: The following papers appeared in a special section of Ancient Mesoamerica (Volume 4, 1993) reporting on "Recent Research on Obsidian in Mesoamerica".

Charlton, Cynthia L. Otis

1993 Obsidian as Jewelry: Lapidary Production in Aztec Otumba, Mexico. *Ancient Mesoamerica* 4:231-243.

Abstract

Research carried out during the last three decades at the Late Postclassic city-state of Otumba, Mexico, has identified a wide variety of craft-production specializations. Data derived from excavations and surface collections made at the workshop site of Otumba's specialities--lapidary jewelry production--have revealed much of the process for production of such jewelry, including ear spools, lip plugs, and beads, along with some possible secondary products, such as sequins and disks, all primarily made from obsidian. Besides the lapidary products themselves, many of the tools employed in the production--made of obsidian, chert, and basalt--were found. The materials recovered enhance and expand upon the information available from colonial documentary sources, providing greater insight into this complicated and intriguing process.

Darling, J. Andrew

1993 Notes on Obsidian Sources of the Southern Sierra Madre Occidental. *Ancient Mesoamerica* 4:245-253.

Abstract

Recent fieldwork has identified a previously unknown obsidian source area in southern Zacatecas and northern Jalisco. Evidence of prehistoric use of surface gravel and nodule outcrops in the Huitzila-La Lobera source area includes raw-material

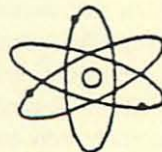
extraction and the production of cores, large blade blanks, rough bifaces, and other artifacts. Unusual variability in color is characteristic of the sources and includes a banded variety described as "rainbow" obsidian. Characteristics of this source area are compared to the Llano Grande obsidian source area in Durango. Implications for understanding the distribution of obsidian from sources in the Sierra Madre Occidental to the cultures of the north Mesoamerican frontier are presented and discussed.

Dreiss, M.L., D.O. Brown, T.R. Hester, M.D. Glascock, H. Neff, and K.S. Stryker

1993 Expanding the Role of Trace-Element Studies: Obsidian Use in the Late and Terminal Classic Periods at the Lowland Maya Site of Colha, Belize. *Ancient Mesoamerica* 4:271-283.

Abstract

The results of trace-element analysis of 200 prismatic blades from Colha, Belize, are reported. Questions concerning possible elite control and restriction of obsidian distribution, and the relative decline and increase of El Chayal and Ixtepeque sources in varying functional contexts within lower- and upper-status areas are the primary focus of this study. Contrary to expectations, a high percentage (51%) of obsidian was assigned to the Ixtepeque source 48% was assigned to El Chayal, and only two samples (1%) were assigned to Rio Pixcaya. The use of obsidian from the Ixtepeque source declines through time from Tepeu 2 through Tepeu 3 from 72% to 43%, and Ixtepeque obsidian appears to have had a largely ceremonial use by the Terminal Classic period. It appears that as Ixtepeque obsidian became less available at the site, it fell more into the hands of the elite. This trend runs counter to our expectations that an apparent lack of elite control of Ixtepeque obsidian existed in the Postclassic. The Colha data suggest that a slightly different process may have governed the distribution of Ixtepeque obsidian in the Late/Terminal Classic than during the Post-classic period. It is not clear, however, whether this trend extends to regional differences in control or is simply a local idiosyncratic phenomenon at Colha.



Freter, Ann Corrine

1993 Obsidian-Hydration Dating: Its Past, Present, and Future Application in Mesoamerica. *Ancient Mesoamerica* 4:285-303.

Abstract

The reconstruction of time is a central concern all archaeologists must address in their research; few, however, are fully aware of the potential of all the dating methods at their disposal. For this reason, this paper summarizes the developmental history and current level of field application of obsidian-hydration dating. It (1) reviews how this dating technique was first discovered and applied, (2) details our current knowledge of the process of hydration and which variables affect its rate, (3) discusses the relative advantages and limitations of the three primary approaches employed to construct hydration chronologies, and (4) presents a protocol for its future application in Mesoamerica. The synthesis of this body of hydration-dating research may help archaeologists more constructively decide how and when to apply this unique and versatile dating technique to their specific research questions by providing the information and guidelines necessary for recovering pertinent field data.

Trombold, C.D., J.F. Luhr, T. Hasenaka, and M.D. Glascock

1993 Chemical Characteristics of Obsidian from Archaeological Sites in Western Mexico and the Tequila Source Area: Implications for Regional and Pan-regional Interaction within the Northern Mesoamerican Periphery. *Ancient Mesoamerica* 4:255-270.

Abstract

A total of 51 obsidian samples from archaeological sites in western Mexico (La Quemada, Totoate, Las Ventanas, Laguna San Marcos) and from the Tequila source area were analyzed chemically by direct-current plasma atomic emission spectroscopy (DCP) and instrumental neutron activation analysis (INAA) in an effort to identify the sources of the archaeological obsidian by step-wise discriminant analysis of the data. Surprisingly, only 3 of the 39 archaeological samples (2 from Laguna San Marcos and 1 from Las Volcan Tequila source Teuchitlan) could be correlated with an archaeological - recognized obsidian. The largest, Group Y, was found to be derived from the La Lobera source located near the Jalisco-Zacatecas border. This source accounted for 12% of La Quemada obsidian

and a higher proportion for Las Ventanas and Totoate. Source locations for the remaining three groups could not be determined from the existing chemical data base. These results indicate that a minimum of interaction took place between La Quemada and the Teuchitlan cultural tradition. It shows that one focus of La Quemada's trace endeavors was in the Rio Bolanos/Tlaltenango valleys.

TECH NOTES

This section of the Newsletter is devoted to sharing new techniques, innovative ideas, source of equipment and supplies, and discussing new technologies. Obsidian analysts are invited to submit information relating to these topics.

OBSIDIAN HYDRATION DATING AND DIGITISED COMPUTER IMAGING

*exerpts taken with permission from an article by
W.R. Ambrose*

("Obsidian Hydration Dating" in *Archaeometry: Current Australasian Research*, Occasional Papers in Prehistory, No. 22, Edited by B.L. Fankhauser and J.R. Bird. Department of Prehistory, Research School of Pacific Studies. The Australian National University, Canberra, Australia. 1993)

Over the last five years there has been a host of papers addressed to various technical problems surrounding the optical microscope measurement of the hydration thickness as the crucial first step in determining an age for an obsidian artefact (Stevenson et al. 1987, 1989a; Scheetz and Stevenson 1988; Jackson 1990). Measurement problems are only part of the difficulty which include, among others, the chemistry, moisture content and thermal history of the site being dated, and the chemistry of the obsidian itself as a determinant in the rate of hydration. In this paper I focus on the problem of hydration measurement. This is an important step not only as the primary dimension for dating an obsidian artefact, but also for calculating the fundamental hydration rate constants of obsidians artificially hydrated at known time and temperature.

As Scheetz and Stevenson (1988) have shown there is a theoretical resolution limit of $0.21\text{ }\mu\text{m}$ attainable using monochromatic light and special oil immersion techniques. A $\pm 0.21\text{ }\mu\text{m}$ resolution limit can translate to a significant age error but this may be compounded by further cumulative errors in other phases of the measurement system. While the limits of optical resolution can be taken as $\pm 0.21\text{ }\mu\text{m}$, this is but another way of saying that this is the limiting dimension of the transitional zone between two optically differentiated materials. The mid-point of the transition zone could be arbitrarily taken as the physical boundary of the two materials being observed. This does not overcome the visual error because the $\pm 0.21\text{ }\mu\text{m}$ range is within the larger indiscernible range of the observer. A method that identifies the mid-point of the transition zone should increase the effective resolution limit in microscopic measurements and avoid observer error in demarcating the boundary.

Instrumental Hydration Measurement

Innovations in computer imaging technology provide a means for overcoming some of the difficulties inherent in the visual measurement of hydration thickness. The basic difference with imaging technology for measurement is that visual judgment is avoided, the minimum unit of differentiation being the pixel, with light intensity being the means for displaying the image either as a grey scale value, or some defined spectral scale; by recording the microscope optical image as a computer based digitised image the minimum distance that can be represented is one pixel. The distance spanned by one pixel can be calibrated for any image by reference to standard micrometer devices. Figure 1 shows a digitised scan across five lines of a graticule micrometer, with an interval between lines of $10\text{ }\mu\text{m}$ to give a $40\text{ }\mu\text{m}$ distance. The vertical axis is an arbitrary grey scale. By counting the pixels over a known distance the distance per pixel value can be determined precisely; once the pixel/length ratio is found it can be simply applied to any other digitised image that operates with the same optical configuration, to give a reproducible length measurement. The software used in this study is provided by Jandel Video Analysis with their JAVA © (1990) system which is designed among other things for image measurement.

One of the important advantages of digitised image measurement is the possibility of enhancing the

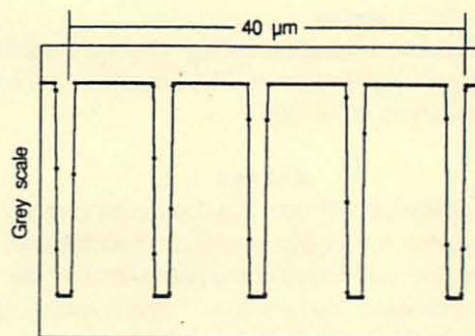


Figure 1 Digitised scan across a microscope stage micrometer divided into $10\text{ }\mu\text{m}$ intervals. One pixel represents a distance of $0.11\text{ }\mu\text{m}$.

image in various ways. In this report the contrast between hydrated and unhydrated areas of the obsidian was enhanced by a grey scale modification procedure. A second important advantage is the ability to integrate the grey scale values over a wide strip across the hydration zone, from the outer surface to the inner boundary within the obsidian, rather than a single line trace from points on the inner and outer boundaries. The effect of this strip integration procedure is to suppress minor differences in texture, surface planeness and hydration front to produce an integrated hydration profile over a longer section of the hydrated obsidian surface. Figure 2 shows the results of this procedure on an obsidian with a hydration thickness measurement of $4.6\text{ }\mu\text{m}$. Once the image is digitised, the profile scans across the hydration zone can be kept as a record of the measurement in a computer file. A video tape recorder grab of the primary image can also be stored as a backup image.

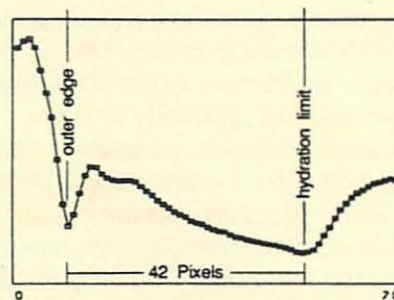


Figure 2 Digitised scan across the hydration zone of obsidian sample 2906. The curve is the mean of 20 scans across different parts of the obsidian hydration zone.

Calibration

Before pixel measurements can be expressed in μm values the equipment needs to be calibrated against a known microscopic length scale; the normal optical microscope stage micrometer is divided into parallel lines at .01 mm intervals but, being manufactured by photo-mechanical means, these gratitudes do have slight variations in line width and line interval. By recording inter-line distances over several intervals on the stage micrometers, a better degree of accuracy can be achieved. A stage micrometer of 1 mm divided into .01mm (10 μm) intervals was used for the calibration. A series of 50 μm widths across the graticule were recorded to give twenty 50 μm readings. The mean pixel value is: (n=20) $456 \pm 6.6 = .11 \pm .002 \mu\text{m}$ per pixel. This calibration is only valid for the optical configuration of the Leitz instrument used for this study with its x100 oil immersion objective, and the Olympus microscope stage micrometer. The advantage here is that the ultimate definition of the image could be within $\pm 0.11 \mu\text{m}$, against the primary optical image resolution of $\pm 0.21 \mu\text{m}$, if the mid-point of the transition zone is taken as the arbitrary edge of the image. By avoiding the judgment of the observer in recording the measurement a further major improvement in reproducibility is gained. This system applied to a set of obsidians from two known age radiocarbon dated sites closely confirms their relative age separation.

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Stevenson, C.M., W.P. Freeborn and B.E. Scheetz

1987 Obsidian hydration dating: An improved optical technique for measuring the width of the hydration rim. *Archaeometry* 29(1):120-3.

Stevenson, C.M., D.Dinsmore and B.E. Scheetz

1989 An inter-laboratory comparison of hydration rim measurements. *International Association for Obsidian Studies Newsletter* 1.

MEETINGS AND EVENTS

1995

April 2-7. Archaeological Chemistry. Symposium to be held at the American Chemical Society National Meeting, Anaheim, California. Major areas of interest: Bone Dating, Artifact Dating, Archaeology of Genetic Material, and Peopling of the New World. Contact: Mary Virginia Orna, College of New Rochelle, New Rochelle, NY 10805 USA; tel 914-654-5302; fax 914-654-5387.

April 3-7. European Geophysical Society, 20th General Assembly. Hamburg, Germany. EGS Office, Postfach 49, Max-Planck-Str. 1, 37189 Katlenburg-Lindau, Germany; tel: 49-5556-1440; fax: 49-5556-4709; e-mail: egs@linax1.dnet.gwdg.de.

April 3-7. Geological Society of South Africa Centennial Geocongress. Johannesburg. Congress Secretariat, Centennial Geocongress, PO Box 36815 Menlo Park, 0102, South Africa; tel and fax: 27-12-47-3398.

April 9-11. Annual Meeting of the Society for California Archaeology. Eureka, California. Breck Parkman, California Department of Parks and Recreation, 20 East Spain Street, Sonoma, CA 95476, USA; tel: 707-983-1519.

April 17-21. Materials Research Society, Spring Meeting. San Francisco, California, USA. Materials Research Society, 9800 McKnight Road, Pittsburgh, PA 15237, USA; tel:412-367-3003; fax:412-367-4373.

May 3-7. Society for American Archaeology. Minneapolis, MN. Contact SAA, 900 2nd St, NE #12, Washington, DC; tel: 202-789-8200; fax: 202-789-0284.

May 17-19. Geological Association of Canada-Mineralogical Association of Canada Joint Annual Meeting. Victoria, British Columbia. Chris Barnes, General Chair, SEOS, University of Victoria, PO

Box 1700, Victoria, BC V8W2Y2, Canada; fax: 604-721-6200.

July 3-5. Archaeological Science Conference; held in cooperation with the Council for British Archaeology Archaeological Science Committee. Liverpool. The Science Conference Organisation, Department of Archaeology, 14 Abercromby Square, University of Liverpool, PO Box 147, Liverpool, L69 3BX, UK.

August 29-Sept. 2. ECAART 4- European Conference on Accelerators in Applied Research and Technology. Zurich. Martin Suter, Chairperson ECAART 4, ETH Honggerberg, Institute of Particle Physics, Building HPK, CH 8093, Zurich, Switzerland; tel: 41-1-633-2033; fax: 41-1-633-1067; e-mail: suter@imp.phys.ethz.ch.

November 6-9. Geological Society of America, Annual Meeting. New Orleans, Louisiana. Vanessa George, Geological Society of American, 3300 Penrose Place, Boulder, CO 80301, USA; tel: 303-447-2020; fax: 303-447-1133.

November 15-19. American Anthropological Association, Annual Meeting. Washington DC., USA. American Anthropological Association 4350 North Fairfax Drive, Suite 240, Arlington, VA 22203, USA; tel: 703-528-1902.

1996

May 20-24. International Symposium on Archaeometry. Urbana-Champaign, Illinois. Sarah Wisseman, ATAM Program, University of Illinois, 116 Observatory, 901 S. Mathews, Urbana, IL 61801, USA; tel: 217-333-6629; fax: 217-244-0466; e-mail: wisarc@ux1.cso.uiuc.edu

AVAILABLE PUBLICATIONS

The Archaeological Research Facility at University of California, Berkeley would like to announce the high-quality photocopy reprint of Contribution No. 45, *Obsidian Studies of the Great Basin*, Edited by Richard E. Hughes, 231 pp., 1984.

Contributors in this volume include: Hughes, Hampel, Nelson, Bettinger, Delacorte, R. Jackson,

Trembour, Friedman, J.O. Davis, T. Jackson, Bouey, Basgall, Tuohy, Stross, and Meighan.

This volume can be ordered for \$14.00 from the Archaeological Research Facility, Department of Anthropology, University of California, Berkeley, CA 94720-3710; tel: 510-642-2212.

Make check payable to Regents, University of California. Orders are sent fourth class book rate. Add \$3.50 to publication price when ordering one item; \$1.00 for each additional item. California residents add 8.25% sales tax.

Foreign orders: Prepayment required in U.S. funds. Overseas orders are sent surface mail fourth class. For overseas airmail, please add \$4 per publication.

CALL FOR ARTICLES AND INFORMATION

Submissions for articles, short reports, abstracts, or announcements for inclusion in the next newsletter should be received by June 15, 1995. We accept electronic media on IBM compatible 3.5" or 5.25"

diskettes, in a variety of word processing formats including Wordperfect (5.n), Wordstar, and Microsoft Word, or ASCII text formats. A hard copy should accompany diskettes. Send to Blossom Hamusek, c/o Department of Anthropology, California State University, Chico, California, 95929-0400; (916) 898-6256.

Short Reports & Reviews: If you are interested in briefly reporting on research findings (e.g., onecolumn in length), contact Mike Rondeau at Caltrans, Environmental Project, 650 Howe Avenue, Suite 400, Sacramento, California 95825; (916) 263-3375; FAX (916) 263-3384.

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 sourcing results;
- 3) provide technical support in the form of training and workshops for those wanting to develop their expertise in the field.
- 4) provide a central source of information regarding advances in obsidian studies and the analytic capabilities of various laboratories and institutions.

Membership

The IAOS needs membership to ensure the 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/year
- Life-Time Member \$200.00

Regular members are individuals 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 fees may be reduced or waived in cases of financial hardship or difficulty in paying in foreign currency. Please complete the form and return to the Secretary 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 is spent in currency exchange.

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