International Association for Obsidian Studies Newsletter

Number 7 **Summer 1992**

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Assembled and edited by K. Tremaine and R. Jackson

CONTENTS

NEWS AND INFORMATION

VolcanoNet

Be the first one on your block to know about the latest eruptions at Mount Spurr (Alaska)or at other currently eruptive hot spots around the world! Although historic eruptions of obsidian are rare (the most recent [1771] bona fide obsidian flow that I could find was located on Vulcano, an island located just north of Sicily), volcanologically-minded obsidian researchers with Internet access may want to consider joining VolcanoNet. This is an Internet-based BBS organized by Dr. Jonathan Fink of Arizona State University. Announcements of recent volcanic activity or related matters are sent to all VolcanoNet subscribers. To join BBS, send a short e-mail note requesting a subscription to:

jfink@nfs.gov (Internet) or jfink@asuacad(Bitnet)

Alternatively, you can find him (from October 1, 1992, to August 8, 1992) at: National Science Foundation • Geochemistry and Petrology, Room 602 • Washington, D.C. 20530 • (202) 357-7916 • (202) 357-0364 FAX

If you have any questions about VolcanoNet, you can also drop me a line at skinner@jacobs.cs.orst.edu.

Programmatic Treatment Plan for Obsidian Quarries

The Inyo National Forest has completed a draft programmatic treatment plan for obsidian quarries. The focus is on the large Casa Diablo source, which has been the most intensively studied of all the sources on the Forest. The plan contains a long-term research design for all of the sources, standardized records and visual identification procedures, and descriptive terms in addition to a detailed information about Casa Diablo. The document is out for review. Those who have not received a copy can obtain one from Linda Reynolds, Inyo National Forest, Bishop, CA 93514; (619) 873-2423.

Southwest Archaeological Obsidian Project

This June, M. Steven Shackley (University of California, Berkeley) received funding from the National Science Foundation to continue the *Southwest Archaeological Obsidian Project* for the next two years. The project is focused on the quantitative re-analysis of the source standards originally reported semi-quantitatively in Shackley (1988), as well as discovering the location of a few as yet unlocated geological glass sources. Much of the XRF lab work is being performed by Susan Kerho, and a Research Experience for Undergraduates (REU) grant from NSF is being applied for. These data will be important in providing inter-laboratory information for any researcher doing work in the American Southwest.

Shackley, M. Steven

1988 Sources of Archaeological Obsidian in the Southwest: An Archaeological, Petrological, and Geochemical Study. *American Antiquity* 53(4):752-772.

Obsidian from the Russian Far East

This summer Yaroslav Kuzmin (Pacific Institute of Geography, Vladivostok), and Andrew Tabarev (Institute of Archaeology and Ethnography, Novosibirsk) submitted 45 samples of archaeological obsidian from 14 sites in the Russian Far East to M. Steven Shackley (University of California, Berkeley), and Michael Glascock (Research

Reactor, University of Missouri) for geochemical analysis. The EDXRF analysis by Shackley indicates the presence of six geochemically distinct source groups in the assemblage. Glascock will be subjecting the same samples to NAA in the near future. Kuzmin and Tabarev will begin searching for the geological sources of the material this fall.

Additionally, Tom Jackson (BioSystems Analysis, Santa Cruz, CA) recently visited Vladivostok and procured an additional 30 some specimens from one site north of the city for analysis. Everyone involved is collaborating on these analyses. This work is the first primary geochemical study of archaeological obsidians from this part of the world.

IAOS Annual Meeting

The International Association for Obsidian Studies held its fourth annual meeting on Friday, April 24th at the Hilton Hotel, Pasadena, California, during the Society for California Archaeology Annual Meeting, narrowly missing a big earthquake and the famous riots. Our new president, Craig Skinner recaps the event in Greetings... below.

New Officers

The torch was passed from Thomas Origer (past IAOS President) to Craig Skinner (past President Elect). Craig's biography can be found in Newsletter Number 5, Summer/Fall 1991. Our new President-Elect is Dr. Steven Shackley (more on Steve below). Lisa Swillinger was reelected to her position as Secretary/Treasurer.

Greetings From the President

As I write this (September 21st), the summer is officially over - time to settle down, catalog samples, write reports, and put together newsletters. I trust that all of you got your field work done for the year. I know that I didn't. If I procrastinate much longer, I'll be out on cross-country skis trying to finish things up.

The Annual Meeting is once more an event of the past and we can look forward to getting together again next year in conjunction with the Society for California Archaeology Meeting at Pacific Grove. For those of you who made it this year, it was nice to see you - hope to see you all again next year. Stay tuned to future newsletters for more details as the next meeting draws closer. My congratulations to Steve Shackley, the new President-Elect, and to Lisa Swillinger, our re-elected Secretary-Treasurer. My thanks also to everyone who ran for an IAOS office - we greatly appreciate your participation. It was a good meeting (enhanced by Lisa Swillinger's gala lunch) with an excellent turnout (46 present), although we did forget to gather names this year. We agreed afterwards that we were a little short on time and didn't touch on all the topics but, ah, well, next year...

1991 was a good year for the IAOS. Our total membership has doubled since 1991 (from 42 to about 85), our finances are on solid ground, and we've begun to expand from a mostly regional (read mostly California with a few out-of-state members) to a quasi-regional/international group. IAOS members can now be found in seventeen states and six countries: Alaska, Arizona, California, Colorado, Hawaii, Illinois, Louisiana, Massachusetts, Missouri, Nevada, New Mexico, New York, Ohio, Oregon, Pennsylvania, Texas, Wisconsin, Australia, Mexico, New Zealand, and Russia. The majority of us (49) are still from California, but I'm quite pleased with the significant geographic expansion over the last year.

So, what's in store for 1992-1993? What kind of good stuff can we come up with to entice new members and keep old ones? Here are some of the projects that are in the works:

1. A new copy of the IAOS Obsidian Bibliography (version 1.5) should be out sometime around Christmas. This time, Kim Tremaine and I are also going to produce a desktop paper model so that you don't have to fire up your computer to use the bibliography. We'll also distribute an optional disk model, as well - there are still some distinct advantages to the electronic version (such as quick text searching for keywords embedded in reference titles). The paper bibliography will be mailed out to everyone as soon as it's completed - the disk will, as usual, be available on request. I've also sent a copy of the most recent version of the bibliography to the Society for Archaeological Sciences Internet bulletin board in New Zealand and hope that the bibliography and news of the IAOS will spread from there. A review of the bibliography should also be appearing in a forthcoming issue of the *Journal of Geological Education.*

2. The long-rumored IAOS membership list should appear in the next issue. It will be a draft version; we haven't been collecting enough information (like phone numbers) about members and weren't able to compile a finished version yet. You'll have to let Lisa Swillinger know about any missing information (there's quite a bit) - we'll update the list and then publish a new one about once a year. If there is information that we might have that you don't want included in a published membership list, please let me or Lisa know ASAP.

3. We're looking into purchasing some obsidian-related publications from various sources for redistribution to IAOS members. If this works out, we may be able to offer these to you at considerably reduced prices. If you have any particular titles in mind, get in touch with me and I'll put them on my consideration list.

4. We're still trying to spread the word about the IAOS and will soon (after the Christmas rush) be working on a major membership drive. We now have descriptive IAOS flyers that we're planning to mail out to a wide variety of prospective members all over the planet. For those of you who are also members of the Society for Archaeological Sciences (SAS), watch for an IAOS notice in an upcoming issue of the *SAS Bulletin.*

5. We're going to try to publish the Newsletter on a more regular basis. Help!! Send us your current research news, abstracts and reviews of the obscure and not-so-obscure literature, and thoughts on obsidian-related topics. If you've been out doing obsidian research, we'd like to hear about it.

6. The obsidian hydration and characterization laboratory questionnaires that Kim Tremaine and I distributed earlier this year are back. See this and the upcoming issues of the Newsletter for what we found out.

7. You may have noticed that this issue of the *IAOS Newsletter* was mailed to you with laser printer mailing labels attached. These were produced from our new, just-functioning membership database. Watch your label in future issues for information concerning your expiration/renewal date.

That's all for now. If you have any ideas or suggestions, please get in touch. I'd be delighted to hear from you. Until the next issue of the Newsletter ...

Craig Skinner • 1414 NW Polk • Corvallis, Oregon 97330. Internet:skinncr@jacobs.cs.orst.edu

About our new President-Elect

Our new President-Elect is Dr. Steven Shackley. He is currently Assistant Research Professor for Archaeology at the Phoebe Hearst Museum of Anthropology at the University of California, Berkeley. Recently receiving his Ph.D. from Arizona State University in 1990, Steve's interests include the long term *Southwest Archaeological Obsidian Project*, in part funded by the National Science Foundation and the Lowie Museum. He actively pursues lithic technology as a means of inference toward the reconstruction of hunter-gatherer range and mobility in concert with the geochemical provenience analysis of obsidian. He has published a number of articles and book chapters in *American Antiquity, American Anthropologist, Kiva*, many private sector reports, and have upcoming articles in *Geoarchaeology*, and a book with Westview Press scheduled for release in 1993. All of these publications have dealt with issues of obsidian geochemistry and lithic technology. Steve is an active member of the Geological Society of America, International Association for Obsidian Studies, Phi Beta Kappa, Society for American Archaeology, Society for California Archaeology, and certified in Field and Archaeometric Research by the Society of Professional Archaeologists.

In his position statement, Steve writes:

As a member of IAOS and the Society for Archaeological Sciences (SAS), I have become increasingly aware of the need for analytical and reporting standards for the geochemical analysis of obsidian. This, of course, has worldwide implications. As with obsidian hydration analysis, standardization raises the level of reliability and decreases inter-observer errors. I am organizing a symposium for the 1993 SAA meetings in St. Louis on *Advances in Archaeological Obsidian Studies* to be published in the new SAS series *Advances in Archaeological and Museum Studies*. I see this as the perfect vehicle, jointly sponsored by SAS and IAOS to bring together rather diverse ideas about obsidian geochemistry and hydration in a public forum. I think it is time to move the avenue of IAOS from the Society for California Archaeology to a national and international level. My point here is not really different from the goal of the previous presidents, Chris Stevenson, Tom Origer and Craig Skinner- that the IAOS has the potential for uniting a very diverse international field. To this I think the Association should devote much of its energy.

ARTICLE

E-Mail and Obsidian Researchers: Staying in Touch in the Information Age

by Craig E. Skinner

Consider this. You're sitting at your desk huddled in front of your word processor and working on a contract report whose deadline is beginning to loom uncomfortably large. As you deftly analyze and interpret your expensive obsidian data, you notice that several artifacts are correlated with a strange Oregon obsidian source that you've never heard of and for which you have no references. What next? Time is short. Should you spend valuable time fishing for a minor but possibly significant bit of information, or should you write around it? After all, who will probably notice ... except you. Then you recall the Oregon IAOS member who might be able to give you a quick answer or a reference to look up. You switch to your telecommunications software, log on to your favorite network, and send off a quick note to **skinncr@jacobs.cs.orst.edu** (my Internet e-mail address). Anywhere from a few hours to a few days later, you check your e-mail box and there is the bit of information you need. It's taken us both only a few minutes of our time and all is well - your report is complete and I've gotten to pass on some obscure little nugget of information that has been rattling around in my head or filing cabinet for years. No telephone tag. No long-distance charges.

What I've just described here is a simple use of electronic mail (e-mail). The writer could have been sitting in a corporate laboratory or home office in California, Maine, New Zealand, Germany, or many other locations around the world. I'm still a bit astounded to be able to sit in my home or work office and, in a single session, check my e-mail box at Oregon State University, read the latest computer news, send a note to a friend in Portland, answer a message from an acquaintance in California, reply to a request from a newsletter editor in Boston, download a software utility that was described in a computer magazine, check the Berkeley library to see if they have a book that I'm looking for, and browse around computers in Maine and Germany for interesting-looking software. If this

sounds like fun to you, you may be a telecommunications and e-mail candidate!

Will the incorporation of e-mail and telecommunications into your life really make a difference or is this just another complication of the electronic age to deal with? How many people can even program their VCR? Will this be any better? The answer is ... you'll have to decide. If telecommunications are a resource that suits you and you're willing to deal with the initial learning curve, you may find that this is one of those things that you can no longer do without. Archaeologists that I've talked with either love it or couldn't care less!

My Personal Favorite - The Internet System

The Internet system, an interconnected worldwide system of numerous networks, is easily available for those of you with university connections or possibly, those living near a university. Provided you have a valid Internet electronic address, you can send mail to (or receive mail from) any of the thousands of other Internet sites. The Internet supports a variety of different network services but the most widely used of these is e-mail. Also available at many sites are databases, most commonly library databases, and access to libraries of public-access files for different computer systems (including PC's and Mac's). Internet also maintains gateways with other major academic networks such as BITNET and with commercial services such as CompuServe and MCI Mail, allowing you to send mail out among these different entities.

How do you get an account that will let you have access to the Internet? This depends on where you live. If you're located near a university or community college, try the computer science department or the computing center for information. If you are a student or are on the staff, you shouldn't have any problems. If you're not associated with a university, don't give up. Some universities offer public-access accounts that local community members can plug into. Another alternative to university connections is to join a local non-university electronic bulletin board system (BBS) that offers access to the Internet as one of its services. Ask around - these are usually found in larger cities and are most often fee-based subscription enterprises. These non-university Internet points will give you a link to the Internet system, though they usually offer mail-only capabilities.

For those of you who can't find straightforward access to Internet, it's easy to send and receive Internet mail through CompuServe, Prodigy, America Online, and most of the other major commercial e-mail vendors. Although you will have to subscribe to a commercial service if you go this route, this does give you access to the worldwide Internet system from anywhere in North America (and possibly other countries) that has a phone line installed (plus access to whatever services the commercial provider might provide such as access to software and databases).

What Do You Need to Get Plugged In?

First of all, you've got to have a microcomputer and a modem. You don't need an IBM PC to use the networks, but more IBM PC's exist than anything else and the largest share of software available from bulletin boards is for IBM PC microcomputers. Modems come in a variety of configurations and speeds with the best price to speed ratio currently centered at 2400-bps (about $100). Once you've got a modem installed, you'll need telecommunications software to run it. The most widely used of these, at least for IBM PC compatibles, is Procomm/Procomm Plus, available either in a shareware version or a bells-and-whistles commercial version. The shareware (legal to copy and share) version is available at a minimal charge from shareware distributors (look in the back of any PC magazine) and from many computer stores.

Good luck. If you have any questions, want to see if your e-mail really works, or want to check up on that obscure Oregon obsidian reference, drop me a note at one of my e-mail addresses. I'll see you on the networks!

More Information

Donnalyn, Fred and Rick Adams. 1990. A Directory of Electronic Mail Advertising and Networks. O'Reilly & Associates, Inc.: Petaluma, California, 420p.

John C. Dvorak and Nick Anis. 1990. *Dvorak's Guide to PC Telecommunications*. Osborne-McGraw-Hill: New York, New York, 1053p.

Steinberg, Don. 1991. Conquer the E-Mail Frontier. *PC Computing*, 4(6):191-196.

ARTICLE

Flakes vs. Projectile Points: Changes in Obsidian Procurement in Prehistoric Mendocino County, California, Suggested by Hydration Analysis

by Viviana Inés Bellifemine

During the spring semester of 1991 a class on obsidian hydration dating was offered by the Department of Anthropology at San Jose State University, under the direction of Dr. Thomas Layton. Members of the class performed obsidian hydration analysis on a sample comprised of obsidian waste flakes and projectile points excavated from MEN-1930, an archaeological site located 12 Km northwest of Ukiah, California.

Our sample was comprised of 15% of the total obsidian flakes recovered from each of nine 10 cm levels in a 1.5 by 1.5 m excavation unit, yielding a total of 105 flakes of Borax Lake obsidian and 93 flakes of Konocti obsidian (visually sourced by Thomas Origer). Hydration measurements were also performed on nearly all the obsidian projectile points recovered from the site, yielding 12 measurements on large bipoints and 19 measurements on small corner-notched arrow tips (Rattlesnake series).

The hydration results, when plotted, indicated an anomaly. Whereas the hydration measurements on large obsidian bipoints appeared to have a distribution analogous to those of the obsidian waste flakes, hydration measurements on small corner-notched arrow tips appeared to postdate the flaking debris.

In an attempt to determine whether the anomalous pattern of hydration measurements derived from MEN-1930 was valid, we decided to sample a second site, MEN-1932 located 0.5 Km northeast of MEN-1930. For this site we took a 4% sample of flakes from nineteen 20 cm levels from selected units, yielding a total of 101 flakes of Borax Lake obsidian and 65 flakes of Konocti obsidian. Hydration measurements were again performed on nearly all the obsidian projectile points recovered from the site, yielding 15 measurements on large bipoints and five measurements on small corner-notched arrow tips.

When we plotted the hydration measurements from MEN-1932 we found their distribution to be similar to that from MEN-1930. Again the measurements on bipoints appeared to have a distribution comparable to those of obsidian waste flakes, while hydration measurements on the small corner-notched arrow tips appeared to postdate the flaking debris.

In Figure 1 we have plotted the obsidian hydration measurements (358 flakes and 51 projectile points) from the two sites. The measurements on obsidian bipoints are seen to cluster with the major mode of obsidian flaking debris between 2.0 and 3.5 %m. In contrast, the corner-notched arrow tips cluster on the left tail of the distribution, between 1.0 and 2.0 %m, where there are very few hydration measurements on obsidian flakes.

This anomaly is most likely the result of a change in obsidian procurement between the period when obsidian bipoints were being manufactured and the subsequent period in which corner-notched arrow tips were being manufactured. Initially, obsidian was probably obtained in the form of large bifaces which were later reduced to large bipoints, producing in the process a large amount of obsidian chipping waste. A dramatic reduction in volume of chipping debris later in time might be explained if arrow tip blanks, requiring minimal flaking before being put to use, were being exported from the Borax Lake and Konocti obsidian sources. While at MEN-1930 and MEN-1932 the absolute number of finished obsidian projectile points, both early and late, seems not to vary greatly, there are vast differences in the amounts of chipping debris associated with them.

A similar pattern has been found by Tremaine (1986), working at YOL-139 near Knoxville, California. At this site, a late component comprised of Rattle-snake series corner-notched projectile points and a variety of bead types, was not represented in hydration measurements of chipping debris. Tremaine had initially sampled medium-sized flakes recovered from 1/4" mesh screens. When she resampled the site employing 1/8" mesh screens, she was able to recover smaller flakes documenting the late occupation.

From this research I conclude that it is incorrect to assume that by submitting obsidian waste flakes for hydration measurements, we will be able to recognize all of the components during which obsidian was in use. Clearly, such a sampling technique will not discriminate a late component during which arrow tip blanks are imported ready-made.

The fundamental message to be derived from this research is that archaeologists should adequately sample both chipping debris and formed tools, and then compare the respective distributions of hydration measurements if they wish to discern changes in obsidian procurement.

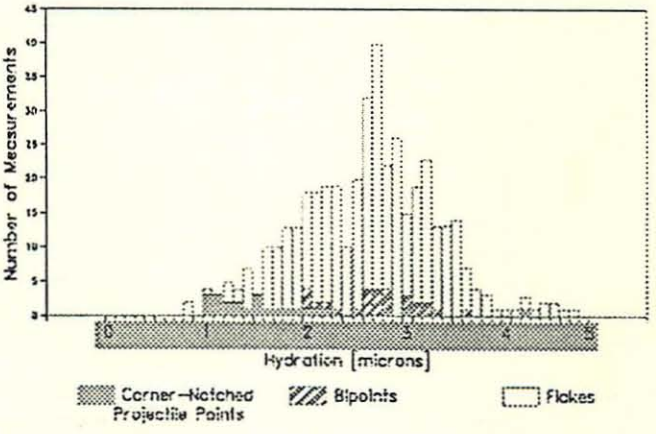
Acknowledgements: I wish to thank Mark Gary and Deborah McLear for allowing me to analyze the obsidian derived from their excavation at MEN-1930 and MEN-1932. Tom Origer visually sourced all of the obsidian reported here. Glen Wilson and Jeff Hamilton helped with the obsidian hydration measurements. Special thanks go to Dr. Thomas N. Layton for suggesting the problem and for acting as my mentor.

References

Tremaine, Kim
1989 "Experimentally Derived Comparison Constants for Hydration Analysis of North Coast Range Obsidians: A Relative Dating Approach." Presented at the 23rd Annual Meeting Society for California Archaeology, Los Angeles, March 16-18, 1989.

1986 CA-YOL-139: An Archaeological Site on Davis Creek Near Knoxville, Yolo County, California. On file, California Archaeological Inventory, Sonoma State University (S# 8833).

MEN-1930 & MEN-1932



Note: All hydration measurements on Borax Lake specimens were compared with those of Konocti, using Tremaine's (1989) experimentally derived comparison constant which suggests that Borax Lake measure-

ments multiplied by 0.79 are roughly equivalent to Konocti measurements if the obsidians have experienced similar environmental histories.

SHORT REPORTS

Compiled by Michael F. Rondeau of CALTRANS, Office of Environmental Analysis, 650 Howe Avenue, Suite 400, Sacramento, California 92825 USA; (916) 920-7458; FAX (916) 920-7149.

The number of archaeological projects involving specialized obsidian studies is constantly increasing. New reports are finalized, fresh studies are begun, and older findings remain obscured in the gray literature of CRM reporting. This short reports section seeks to provide a brief sampler of recent reports, research in progress, and reports on past studies that have been extent for sometime. For contributions to Short Reports involving current or past studies as well as those still in progress, contact Mike Rondeau.

Oregon's Canyon Owl Site: A Progress Report

The Canyon Owl site (35LIN336) was excavated by Dr. John Fagan of Archaeological Investigations Northwest, Inc. The work was done for Willamette National Forest. The site is located in the Cascade Mountains near Sweet Home, Oregon at an elevation of ca. 2000 ft. in a Douglas fir forest of the Western Hemlock Zone. It is near a ridge system and the confluence of Canyon Creek and the Santiam River. The site is comprised mainly of flaked obsidian with a small amount of chert. The obsidian was found to be ca. 98% from the Obsidian Cliffs source with one piece from Devils Point. Four or five pieces appear to be each from a different and as yet unidentified glass source. The obsidian source determinations were made by Tom Jackson.

The large majority of projectile tips are lanceolate Cascade points with serrated edges. A lesser number of smaller, square stemmed points with grinding on the lateral stem margins were also recovered along with three corner-notched points. Site use appears to span the Archaic Period with activities concentrated during the early Archaic (Cascade Phase 8,000-6,000 B.P.).

Obsidian Cliffs glass was used for the hydration analysis which included all flake tools and points. Obsidian debitage was taken from all units and strata. A total of 172 specimens were studied. Three temporal periods appear to be defined with band width ranges of 1.1-1.5, 2.6-3.0, and 4.1-4.5 microns. The bulk of the obsidian falls between 2.5 and 3.5 microns. The hydration band analysis was accomplished by Rob Jackson.

The lithic technology of the obsidian indicated late stage biface thinning using large flake blanks that had been unifacially thinned previously on their dorsal surfaces. Numerous small point fragments, alternate, and square edge removal pressure flakes all indicated that the rejuvenation of points commonly took place on-site.

Blood residue analysis of the points, scrapers, choppers, and cutting tools indicated extensive killing and processing of mountain sheep throughout much of the site occupation. Mountain sheep do not inhabit the region today. They are adapted to a more xeric environment. This finding of mountain sheep residue may fit well with the placement of much of the Canyon Owl site occupation within the Altithermal climatic episode.

Study in Progress: Old Coso Hydration Bands at CA-SBR-6816/H, Southern California

The limited testing of a peripheral area of CA-SBR-6816/H has yielded consistently large hydration band widths. The site is located at the northern end of the San Bernardino Valley near the base of the San Gabriel Mountains in Fontana at an elevation of ca. 2100 ft. Philip de Barros of Chambers Group, Inc. is the principal investigator for this study. The archaeology was undertaken as part of the Hunters Ridge Development project.

The site is situated in an alluvial fan scrub environment along San Sevaine Creek. Several handstones and bedrock grinding slicks were identified in the area tested. Sixteen of the 31 recovered flakes were obsidian which presented an atypically high percentage of volcanic glass. All specimens were identified as being from the Coso source by Paul Bouey. The flakes were small and mainly attributed to pressure retouch and percussion biface thinning.

Most of the hydration band widths fell between nine and 11 microns with a mean of 9.3 microns. The hydration analysis was accomplished by Glenn Russell of the UCLA Obsidian Hydration Laboratory. This tight a cluster of older hydration bands is reported to be unique in the region.

Initial Studies of Timber Butte Obsidian, Idaho

Archaeological test excavations (Gaston and Petersen 1988) and subsequent data recovery (Lewark and Benson 1989) at the Cottonwood Creek sites (10BO418 and 10BO419) allowed for the first in depth analysis of Timber Butte obsidian, a well known source in southwest Idaho. These two sites are located 25 miles north of Boise at an elevation of ca. 3940 ft. in a sage/grass upland environment along Cottonwood Creek. Previous excavations from the Boise Valley to the south to Cascade Reservoir to the north have yielded between 70% and 90% Timber Butte obsidian Occupation at these two sites mainly fell between 5000 and 1000 B.P. Large Side-notched, Elko, Rosegate, and Desert Side-notched points are featured. These sites, located 12 miles from the Timber Butte obsidian source, yielded flaked stone that was ca. 90% obsidian with small amounts of basalt and cryptocrystalline silicates. All of the obsidian was from the Timber Butte source. It was chemically found to be distinct from all other Idaho sources due to its very low iron and zirconium content. The source determinations were made by Richard Hughes.

Obsidian hydration analysis of two distinct site areas at 10BO419 had hydration band widths that ranged from 1.5 to 5.5 with a mean of 2.56 microns in one area and from 2.6 to 7.4 microns with a mean of 4.3 at the other. The hydration band width study was done by Tom Origer.

Research Issues in San Diego Archaeology, Southern California

Research Issues in San Diego Archaeology is a compendium of research topics for the San Diego region published by the San Diego County Archaeology Society. It is edited by Don Laylander. The compendium was last updated in July of this year. The contents are ordered into six sections concerned with chronology, various functional concepts, resource use, various elements of spatial relationships, the historic period, and archaeological methodology. A series of research issues are presented under each section.

Each research issue is presented with the same format: 1) a discussion of the issue including citations; 2) a list of test propositions; 3) a review of data requirements to test those propositions; and 4) references. In this way the document provides a basic, data oriented approach. It constitutes a useful and therefore important baseline from which regional archaeology may expand and grow. In keeping with this intent periodic updating and revisions to this document are planned.

At least four research issues are directly focused on obsidian studies: 1) defining the patterns of obsidian scavenging; 2) defining the distribution of obsidian from Baja California; 3) refining the data on late prehistoric obsidian distribution; and 4) determining the Obsidian Butte hydration rate. A wealth of references to relevant studies in the region and elsewhere is provided on these and other topics.

References

Gaston, Jenna and Nicholas Petersen
1988 Archaeological Test Excavations Along Cottonwood Creek Near Horseshoe Bend, Boise County, Idaho. Idaho. Transportation Department, Boise.

Lewark, Dennis and James R. Benson
1989 Horseshoe Bend Archaeological Project, Results of Data Recovery Excavations at Sites 10BO418 and 10BO419, Boise County, Idaho. Evans-Hamilton, Inc., Seattle.

ABSTRACTS AND ANNOTATIONS ON REPORTS AND PUBLICATIONS

Compiled by Kim Tremaine of BioSystems Analysis, Inc., 1017 Front Street, Sacramento, California 95814 USA; (916) 557-4500; FAX (916) 557-4511.

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 Newsletter will alert readers to some of this information by reproducing abstracts and summarizing literature that may be of particular interest to IAOS members.

Agard, Carol

1989 A Preliminary Report on Over-Snow Logging of Obsidian Quarry/Workshop Sites (Abstract). Northwest Anthropological Research Notes, 23(2):151.

ABSTRACT

The cold springs timber sale is a 1600 acre sale with over 1000 acres of observable surface obsidian. Six of the 17 recorded sites are quarry/workshop sites in designated timber sale cut units. In order to protect these sites and allow for timber harvest activities, a plan for over-snow logging was implemented. This study will examine: the "Over-snow Logging Mitigation Plan" developed by the Malheur National Forest timber staff and approved by the Oregon SHPO, the logging system used to implement the plan, and the preliminary results of over-snow logging on three quarry/workshop sites.

Bergland, Eric O., Jeffrey C. McAlister, and Christopher Stevenson

1992 A Comparison of Hydration Rates for Obsidian Cliffs Glass. Paper presented at the 45th Annual Northwest Anthropological Conference, April 16, British Columbia, Canada.

ABSTRACT

Confidently assigning occupation dates to prehistoric lithic sites in the Cascade Mountains of western Oregon has always been difficult primarily due to the poor preservation of datable organic cultural materials. This situation is compounded by the apparent longevity of projectile point styles and by the churning of cultural deposits in the forested environment. The authors will present an induced hydration rate for Obsidian Cliffs glass (the dominant source of Western Cascades archaeological obsidian) and compare this experimental rate with hydration rim meas-

urements and radiocarbon dates from several Oregon archaeological sites.

Chase, Alexander

1873 Indian Mounds and Relics on the Coast of Oregon. American J. Science, 6(31):26-32, 3rd series.

EXCERPT

An obsidian wealth blade and other obsidian artifacts recovered from a souther Oregon coastal midden (exact location not mentioned) are described:

"Of the first class [objects of superstition and personal adornment], the most remarkable are knives, or swords, of black and bluish obsidian. The bones found with these implements were of unusual size, the skull being especially large. The owner was probably a chief, or perhaps a medicine man or doctor.

One of these obsidian knives is double edged and double ended, in shape not unlike a Greek sword, 14 3/4 inches long, 2 inches broad at one end, 1 3/4 inches at the other, tapering toward both ends and edges, and 1/4 of an inch thick at the center. This knife is most carefully knapped, and considering the brittle character of the material, must have required no mean amount of ingenuity and patience to fashion. A second is of the same material, but not so large, being 8 1/2 inches long with a uniform width of one inch, tapering to a point and to both edges. A third smaller one, but of the same shape, is composed of red jasper, mottled with black. Others, smaller still, are of green jasper, and of obsidian of a bluish cast."

Note: This article was reprinted along with detailed annotations by Lee Lyman in Northwest Anthropological Research Notes, 1991, 25(2):177-183.

Dahlstrom, Bruce

1992 Behavioral Interpretations Derived from Archaic Period Lithic Materials in the Napa Valley. Proceedings of the Society for California Archaeology 5(207-217).

ABSTRACT

Only Archaic period prehistoric materials were recovered, during a Caltrans-generated project, from Nap-710/H, a task-specific site in the Napa Valley south of Rutherford. This paper evaluates alternative explanations for obsidian tool production and use through lithic analyses including obsidian hydration, morpho-functional, and replicative studies. This information is used to infer Archaic period activities at the site.

Fagan, John

1990 Temporal and Technological Variability in the Use of Obsidian at the Dietz Site. Paper presented at the Forty-Third Annual Northwest Anthropological Conference, March 22-24, Eugene, Oregon.

ABSTRACT

Clovis and Western Pluvial Lakes Tradition (WPLT) obsidian tools and technologically diagnostic pieces of debitage recently subjected to x-ray fluorescence spectrometry by Richard Hughes are discussed. The results of the trace element analysis are combined with the results of detailed lithic analysis to compare Clovis and WPLT reduction strategies for the production of distinctive projectile points. Use breaks, manufacturing breaks, and methods of rejuvenating and recycling points by both Clovis and WPLT knappers are examined as well as their raw material source preferences. Distinctive cultural patterns reflecting different adaptive and mobility strategies are also presented.

Note: A total of 57 Clovis and 16 WPLT artifacts were characterized.

Freeman, T.A.

1991 Chronometric Determinations for the Northern Del Rey Hills, Los Angeles County, California. Pacific Coast Archaeological Society Quarterly 27(1):1-11.

ANNOTATION (no abstract)

Excavations of nine prehistoric deposits have been conducted in the northern Del Rey Hills of Los Angeles County. Cultural materials recovered included marine shell and obsidian, which were analysed for chronometric purposes. Twenty radiocarbon assays of marine shell valves and 69 hydration measurements on obsidian samples were completed. An additional 77 hydration measurements were obtained from previous investigations. Based on these findings, Freeman suggests that humans occupied the northern Del Rey Hills from Millingstone Horizon times to the historic period. It is noted that both C14 and obsidian hydration readings are sparse for post-13th Century times, with distributions patterns nearly mirroring each other. During this period, Freeman hypothesizes a disruption in obsidian trade and environmental conditions of the playa leading to a partial abandonment of the region, as inhabitants sought specific resources elsewhere.

Huberland, Amy

1992 Preliminary Results of Data Recovery Excavations at Beaver Glade (CA-Men-935), Middle Eel River Uplands, North Coast Ranges. Paper presented at the 26th Annual Meeting, Society for California Archaeology, Pasadena.

ABSTRACT

Preliminary results from data recovery excavations conducted at Beaver Glade (CA-Men-935), located in the Middle Eel uplands of Mendocino County, are presented. Situated at 3000 feet elevation near the headwaters of the Middle Fork of the Eel, this site yielded data from Lower/Middle Archaic to Emergent Period contexts. Results of obsidian, blood residue, lithic, and other studies will be discussed, and their contribution to regional research will be presented.

Hughes, Richard E.

1992 Northern California Obsidian Studies: Some Thoughts and Observations on the First Two Decades. Proceedings of the Society for California Archaeology 5:113-122.

ABSTRACT

Obsidian studies in northern California have been prosecuted in earnest for about two decades. Reconnaissance, collection and geochemical characterization studies laid the foundation for subsequent research devoted principally to chronological (i.e., dating) issues. This paper briefly reviews previous research, addresses the present "state-of-the-art", then concludes with some thoughts on the ways in which future studies may be able to make substantive contributions to anthropological archaeology.

Hughes, Richard E.

1992 Another Look at Hopewell Obsidian Studies. American Antiquity 57(3):515-523.

ABSTRACT

Hatch et al. (1990) recently presented the results of research on the sources and ages of obsidian artifacts from four Hopewell sites in Illinois and Ohio. The present comment identifies ambiguities in artifact-to-source attributions that compromise the subsequent source-specific obsidian-hydration objectives of the study. Examination of laboratory-induced obsidian-hydration rates used in the study, and contradictions between rim measurements on the same specimens lend no support to the authors' conclusion that obsidian was conveyed into these sites throughout the entire temporal duration of Hopewell mound construction.

James, Malcomb A.; D. Godfrey-Smith, and John D'Auria

1991 A Reference Library for Obsidian Sourcing in Northwestern North America Using X-Ray Fluorescence Analysis: An Update of Ongoing Research (Abstract). Northwest Anthropological Research Notes, 25(1):76.

ABSTRACT

Since introducing this research last year in Eugene [at the Northwest Anthropological Conference], a total of 60 chemically-distinct obsidian types from over 40 geological sources in western Canada and the northwestern United States have been solicited and systematically collected. Researchers with the Geological Survey of Canada have opened their sample collections to this search, adding new obsidian types to the source library. Applying SPSS-discriminant-function analysis to the statistical results of the sourcing research shows that, despite recording several chemically-similar sources, a discrimination between the parent geological sources contained in the library can be made with high accuracy. As this work is normalized and collated with other published sourcing data, the library will be used to source approximately 1000 artifacts from various and museum collections in British Columbia.

Jones, George T., and Charlotte Beck

1990 An Obsidian Hydration Chronology of Late Pleistocene-Early Holocene Surface Assemblages from Butte Valley, Nevada. Journal of California and Great Basin Anthropology 12(1):84-100.

ANNOTATION

Jones and Beck report on a study of obsidian artifacts recovered from seven archaeological sites of presumed great antiquity, located in fluvial and pluvial lake margin contexts in Butte Valley, Nevada. Noting that diagnostic projectile points have proven to be poor temporal discriminators, these authors employed hydration and XRF analyses to construct a finer chronological resolution. Their analyses allowed them to assess contemporaneity among assemblages, evaluate continuity of site occupation/use, and propose a chronological order of assemblages. They found that within the sample selected (n=115), 13 obsidian sources were represented, of which only two (Butte Mountain and Brown's Bench) are known. Ranges of source-specific hydration values among the sites were found to be similar, suggesting rough occupational durations. Although Jones and Beck do not supply chronometric ages for these data, supporting a relative dating approach, they make the preliminary conclusion the numerical dominance of deeply hydrated specimens in each sample suggests that use of these localities occurred principally in late Pleistocene-early Holocene times. They point out that improvements in chronological resolution are critical for progress in the study of this occupation period in the Great Basin.

LaLande, Jeff

1990 Summary Report on the 1989 Obsidian-Sourcing Project. Report prepared for the Rogue River National Forest: Medford, Oregon, 38p.

ABSTRACT

A total of 88 obsidian artifacts from 80 prehistoric archaeological sites on the Rogue River National Forest [southwestern Oregon] were submitted for geochemical source analysis. Non-destructive x-ray fluorescence analysis determined the geologic origin of all but four items. All known source areas are located in southcentral Oregon and northeastern California, within less than 150 miles from the National Forest. The summary report presents the data resulting from the sourcing analysis. It also provides some preliminary interpretations of the results, focusing on possible changes over time in the obsidian-source preference of local cultural groups.

Note: The analyses were done by Richard Hughes. Medicine Lake Highland (northern California) sources accounted for 66 percent of the collection; artifacts from the Silver Lake and Spodue Mountain sources (located in southcentral Oregon) made up 27 percent of the artifacts. The most distant source represented (n=1) came from Cougar Mountain, a major quarry site located at the northern margin of the Fort Rock Lake Basin in central Oregon.

Linderman, Carole A.

1992 The Effects of Fire on Obsidian Artifacts: A Problem in Hydration Dating in a Woodland Environment. Unpublished Senior Honors Paper, Department of Anthropology, University of Oregon: Eugene, Oregon, 30p.

Conclusions (pages 25-27)

A woodland environment [western Oregon] with a mosaic of meadows, clumps of brush, and stands of trees contains fuel that will at one time or another feed a fire. Prehistoric sites located within this environment could be adversely affected by forest fires that occur during different time intervals. One likely effect on prehistoric sites is the alteration of obsidian hydration rinds on artifacts that lie exposed on the surface during burning.

I have summarized studies focusing on the impact of fires on prehistoric sites, the observed conditions of artifacts in a site after a fire, and post-burn environmental damage. All of these studies deal with conditions after the fact. A few studies focus on effects before, during, and after the fire. It was this later pattern of study that two field tests on the McKenzie Ranger District followed. The procedures included using obsidian artifacts with known hydration measurements, exposure of the artifacts to fire at varying levels of intensity, and correlating fire behavior to the post-fire hydration measurements.

A 1987 study confirmed that light fuel fires had no effect on obsidian artifacts exposed on the surface. More dramatic were the results from the 1989 fire study. After exposure to intense fire, 81% of the sample of obsidian artifacts studies had been altered to the point that no visible hydration rinds remained.

This last result indicates that forest fires can alter obsidian artifacts located on the surface, actually 'zeroing out' any hydration. Also, fire can cause vegetation loss, leading to erosional processes that can re-expose once-buried artifacts on the surface. Once exposed to the surface, obsidian artifacts may be affected by subsequent fire and their hydration rinds altered. Erosional processes can also bury surface artifacts that have altered rinds These possibilities must be taken into consideration in evaluating samples recovered from surface levels and excavated levels of prehistoric sites in forested regions.

All possible problems that could affect the hydration measurements of obsidian artifacts should be taken into consideration when interpreting hydration results. The effect of temperatures exceeding the approximate threshold of 800 degrees Fahrenheit is one such problem. These effects can greatly limit the ability of researchers to apply obsidian hydration dating methods to artifacts located in woodland sites, where fire, erosion, and bioturbation are endemic.

Note: Data from this intriguing piece of research were also presented in a report to the Willamette National Forest, Eugene, Oregon, entitled The Effects of Fire on Obsidian Artifacts (1991).

Mazer, J.J., J.K. Bates, J.P. Bradley, C.R. Bradley, and C.M. Stevenson

1992 Alteration of Tektite to form Weathering Products. Nature 357(6379):573-576.

ABSTRACT

Recent use of tektites as evidence for a bolide impact at the Cretaceous/Tertiary (K/T) boundary has focused attention on their long-term stability. It was proposed in studies that residual clay features with the spherical tektite morphology result from *in situ* alteration of the original glassy material. By contrast, examination of tektite alteration as an analogue for the long-term degradation of nuclear waste glass has revealed no evidence of alteration, hydration or devitrification either for samples found in nature or for those reacted in the laboratory: no residual clay minerals were observed, and therefore the glass was interpreted as having reacted by a complete dissolution or etching process. Here we show that these apparently incongruent observations can be reconciled through understanding the relationship between the environment in which the glass reacts and the chemical processes that control the reaction rate. We have examined both natural and experimental alteration of tektites and have found that, under conditions of restricted water contact, tektite reaction is dominated by water diffusion and *in situ* hydrolysis of the glass structure, followed by restructuring of the silicate network to form clays. Over time, the effective rate for these processes is lower than that for etching. Thus alteration of tektites to clays, as observed at the K/T boundary, can proceed only under conditions of limited water contact.

Keller, Jorg and Carola Seifried

1990 The Present Status of Obsidian Source Identification in Anatolia and the Near East. PACT (Journal of the European Study Group on Physical, Chemical, Biological and Mathematical Techniques Applied to Archaeology) 25(4):57-87.

ABSTRACT

A survey of obsidian occurrences as possible sources for the prehistoric trade was carried out in the Tertiary and Quaternary volcanism of Anatolia and Armenia. Over 25 obsidian occurrences from Turkey and from the Armenian SSR are characterized by chemical multi-element analysis. Major emphasis was placed on utilizing standard chemical methods which are applied in many laboratories in order to guarantee a maximum reproducibility of results.

It is shown that discriminant function analysis with sets of chemical elements can unambiguously separate these obsidian sources and can trace the provenance of archaeological material. Also, selected element combinations have a high capacity for discrimination of sources and for correlation. The Ca-Fe relationship for major elements and Rb-Sr combined with Zr-Ba plots for trace elements are used in this paper as examples for characterizing all known sources. On the basis of this general characterization, microprobe analysis on minimum sample amounts is a useful and rapid tool for source fingerprinting of archaeological samples, e.g. in the Ca-Fe space. Additional elements for correlation are obtained by non-destructive, semi-quantitative X-ray fluorescence scans using the peak intensities of the most significant elements.

Latham, Thomas S:, Paula A. Sutton, and Kenneth L. Verosub

1992 Non-Destructive XRF Characterization of Basaltic Artifacts from Truckee, California. Geoarchaeology: An International Journal 7(2):81-101.

ABSTRACT

We have developed a new approach to the problem of the chemical fingerprinting of artifacts manufactured from volcanic rocks of basaltic and andesitic composition. The method is an adaptation of standard energy-dispersive X-ray fluorescence spectrometry and is based on the observation that for irregularly-shaped rock fragments, the ratios of the intensities of the characteristic X-rays of certain trace elements are proportional to the ratios of the concentrations of those elements. This observation has allowed us to obtain geochemical data about the artifacts in a way that is rapid, inexpensive, and non-destructive, making it particularly suited to archaeological applications. We have used our approach to compare a suite of artifacts from an archaeological site in Martis Valley, near Truckee, California, with a group of lava flows from the surrounding area. Using a numerical measure of the geochemical difference between samples, we have been able to group the artifacts on the basis of their geochemistry, to determine which artifacts were manufactured from material found in Martis Valley and, in at least one case, to identify the lava flow that was the actual source of the lithic material for several of the artifacts.

Markley, Richard E., and Donna A. Day

1992 Regional Prehistory and California-Great Basin Interaction: An Assessment of Recent Archaeological Studies in the Northern Sierra Nevada. Proceedings of the Society for California Archaeology 5:171-192.

ABSTRACT

This paper evaluates the results of a number of recent archaeological investigations conducted in the northern Sierra Nevada region, with particular emphasis on their contributions to our understanding of California-Great Basin interaction in prehistory. Particular emphasis is placed on an examination of the growing body of obsidian sourcing and hydration data from excavated sites in the region. Analysis of these data indicates that aboriginal populations obtained obsidian in varying frequencies from a variety sources, with a handful of sources most dominant. Variation in frequency was found to be strongly related to the geographic location of sites in relation to source areas. Changes through time in the relative frequency of obsidian from certain sources were documented, and several obsidian exchange networks are postulated.

Miller, Frances

1992 Investigations at the Middle Creek Site (CA-LAK-944), North of Clear Lake, Mendocino National Forest. Paper presented at the 26th Annual Meeting, Society for California Archaeology, Pasadena.

ABSTRACT

The results of the 1990 evaluation of site CA-Lak-944 indicates a period of occupation from about 180 to 5200 years ago. Interpretation of remains suggests that site sue during Early and Late Archaic times was sporadic, with the heaviest and most varied use occurring in the Middle Archaic Period. Intensive lithic technology analysis was conducted to examine tool manufacturing and use patterns. Obsidian hydration analysis suggests that the site has a Middle Period deposit with good integrity. The site has been determined eligible to the National Register.

Parker, John

1992 Temporal and Spatial Distribution of Prehistoric Sites in the Clear Lake Basin. Paper presented at the 26th Annual Meeting, Society for California Archaeology, Pasadena.

ABSTRACT

This analysis uses data from archaeological inventory reports totaling 33,955 acres of intensively inspected ground in the Clear Lake Basin. The size, location, and constituents of 431 prehistoric sites recorded during these inventories were computerized. Computer mapping and statistical analysis were used to break the sites into modal groupings. Obsidian samples were collected from sites of each modal group and hydration studies conducted. This paper presents the preliminary results of this analysis.

Shackley, M. Steven

1992 The Upper Gila River Gravels as an Archaeological Obsidian Source Region: Implications for Models of Exchange and Interaction. Geoarchaeology, 7(4):315-326.

ABSTRACT

Recent geoarchaeological research in the Upper Gila River region of southeastern Arizona indicates the presence of two geochemically distinct archaeological obsidians occurring as small secondarily deposited nodules within the Quaternary gravels and alluvium. Approximately 32% of the nodules recovered in the sample are derived from the

known and reported Mule Creek source upstream in western New Mexico. The remaining 68% of the nodules recovered are derived from another source somewhere in the area, probably in the Tertiary silicic volcanics along the San Francisco drainage or the Upper Gila proper. Additionally, analyses of the Mule Creek primary source data indicates significant geochemical variability not previously indicated by energy dispersive x-ray fluorescence (EDXRF) studies. The presence of Mule Creek glass 50 or more kilometers from the primary source bears significantly on distance to source based studies where secondary deposition is not accounted for.

Silvermoon, Jon M.

1988 The Obsidian Cliff Quarries of the Three

Sisters. Paper presented at the 41st Annual Northwest Anthropological Conference, Tacoma, Washington, March 10-13, 1989.

ABSTRACT

Over sixty archaeological sites, including twenty eight quarries, were recorded during the 1985 and 1987 field seasons in the Obsidian Cliffs area of the Three Sisters Wilderness by personnel from McKenzie Ranger District, Willamette National Forest, Oregon. During these surveys several methodological difficulties were faced concerning site definition. Macroscopic variation in Obsidian Cliffs material is significant with colors of the obsidian ranging from red to brown to gray to black with both translucent and opaque varieties. Samples were taken from various portions of the Obsidian Cliffs flows and submitted to geochemical analysis. Retooling with obsidian artifacts is evidenced by the presence of discarded cryptocrystalline silica and basalt projectile points. Biface preparation was a major activity at the quarries. Biface manufacture was constrained somewhat by a variable quality of the obsidian available. Future research will focus on assessing temporal variations, if any, in quarry use and technological processes as well as identification of procurement routes accessing the Obsidian Cliffs quarries.

Stevenson, Christopher M., Barry Scheetz, and James W. Hatch

1992 Reply to Hughes. American Antiquity 57(3):524-525.

ABSTRACT

Hughes (1992) raises two points in his evaluation of our paper on Hopewell obsidian studies (Hatch et al. 1990): (a) Why did we not attempt to identify the several possible western United States sources from which our Hopewell specimens were derived, and (b) was is legitimate to report hydration-rim measurements with a .1m or less level of accuracy? These issues are addressed within the context of our initial research goals and through reference to the literature on optical microscopy.

Yohe, Robert M., II

1992 Radiometrics, Obsidian Hydration, and Chronology at the Rose Spring Site (CA-INY-372), Inyo County, California. Paper presented at the 26th Annual Meeting, Society for California Archaeology, Pasadena.

ABSTRACT

During the past four years, intensive analyses of materials recovered from the 1987-1989 excavations at the Rose Spring site have focused on chronology, the temporal sensitivity of certain artifact types, and raw lithic material (obsidian) production/reduction strategies over time. Important to these studies has been the radiometric assessment of numerous stratigraphically-sequenced hearth samples and the analysis of obsidian samples for specific source and hydration values. The results of these studies have been both frustrating and illuminating. It is the purpose of this paper to present these data and an interpretation of their impact on our presently held beliefs with respect to prehistory, chronology, and obsidian hydration in eastern California.

York, Andrew

1992 Archaeological Investigations in the Central Antelope Valley. Paper presented at the 26th Annual Meeting, Society for California Archaeology, Pasadena.

ABSTRACT

Archaeological excavations in the Antelope Valley have been largely confined to areas near the valley margins, while the central valley floor (now occupied by Edwards Air-Force Base) has, with a few exceptions, received relatively little attention. Consequently, regional prehistoric land use systems remain poorly understood. Information on prehistoric use of the central Antelope Valley has recently been gathered from excavations and surface collection at two extensive sites in pan-and-dune settings near Rogers Dry Lake. These investigations yielded a significant collection of flaked lithics, beads, and other ornaments, groundstone, and faunal remains, as well as a variety of surface and subsurface features. Several thousand years of site use are indicated, including a significant protohistoric and early historic occupation. Other major findings include evidence of change in obsidian procurement and possible intensification of resource sue. Implications for regional settlement and mobility systems are discussed.

Zeier, Charles D.

1989 Obsidian Hydration Studies at 35-JA-107: A Study of Alternate Methods and Interpretations (Abstract). Northwest Anthropological Research Notes, 22(2):217.

ABSTRACT

Obsidian hydration may be a useful method for dating sites in southwest Oregon where C-14 samples often are not available. Four different approaches to obsidian hydration

were attempted at site 35-JA-107. Two hydration equations consider the effect of chemical composition and variation in hydration temperature; two do not control for these variables. Of the four, the induced hydration equation has provided reliable chronology while controlling for major determinants of the hydration process and site specific depositional features.

HYDRATION LABORATORY SURVEY RESULTS

In January of this year, a questionnaire was sent out to known practicing individuals and institutions in the archaeological/ geological community that are involved in obsidian hydration-related laboratory work. The purposes of this survey were to (1) identify practicing individuals and institutions; (2) determine the range of operating variability between laboratories in order to develop standards and ensure inter-laboratory comparability; and (3) generate laboratory profiles for publishing in the IAOS newsletter. Responses to the questionnaire are summarized below.

Nine laboratories participated in the survey and are profiled in Table 1. It was found that the majority of these laboratories favor a relative over absolute dating approach, advocating caution concerning conversion of hydration measurements into calendric dates. One respondent states "Until we have strong chronological control of obsidian from one source from the Pleistocene to Contact plus control on other confounding variables of hydration, obsidian hydration dating remains a relative dating technique". Another maintains that if sufficient source samples exist to control the relevant variables, absolute dates are possible. Providing such dates is not a part of their basic service, but additional consultation is avaiable. In contrast, one lab acknowledging that relative dating is useful assuming equivalency of context, prefers the implementation of absolute dating and evaluation with other chronometric assays.

In preparing thin sections, only minor differences are practiced. For example, saw blade range from 0.004 to 0.016 in width. One third use a single blade, two-thirds use a double blade. Cuts range from 2 to 7 mm in depth.

A number of criteria were identified for selecting an artifact cut location. These included: capturing as many surfaces as possible (usually two); minimizing loss to the specimen (least diagnostic location); maintaining perpendicularity (avoiding edges not at right angles to the saw cut); avoiding areas appearing to be freshly broken; targeting thicker sections of thin flakes for ease in preparation; and non-cortex locations.

All labs grind thin sections by hand, with one occasionally using a lapidary wheel. Grinding powders range from 400 to 600 grit. The majority of labs use lakeside cement as their mounting medium, while a minority use synthetic resin and piccolyte. It was learned that 1/3 of the labs do not use coverslips. The remaining 2/3rds use variable coverslip thicknesses (from 0.008 to 0.17 mm) depending upon corresponding petrographic slide thicknesses.

In measuring hydration rims, most laboratories generally use 40X to 60X objectives, with total magnification at 500X. One lab measures 800X. The majority of labs use filar micrometers to measure depths of hydration. One lab uses a Watson Image-splitting eye-piece. One uses both a filar as well as a videocaliper system. One uses video micrometrology in conjunction with video image capture and computer image processing.

Criteria for selecting measurement loci are similar. Typically, technicians choose the most resolved areas, attempt to attain measurements representing the least variation, thus selecting the most uniform, parallel edges, and well defined diffusion fronts. Every laboratory stated that they examine all surface edges. The number of measurements recorded per edge seems to vary not only between technicians but with each thin-section, depending on the quality of the piece. It may be that a specimen is so poorly resolved that it is possible to eek out only two measurements. On the other hand, a specimen may exhibit a great deal of variability, and in this case many measurements may be taken. But on average, from 6 to 10 measurements were reported for single-band specimens. The majority of technicians preferred measuring under polarized light, some specifying a gypsum plate. All laboratories were interested in participating in the Inter-laboratory Comparison (a slide set is making the rounds).

Two-thirds of the laboratories maintain computerized databases (either dBase, ASCII, or Paradox). Everyone expressed some degree of interest in participating in a centralized database.

If there are any individuals or institutions that were inadvertently left out of this survey and wish to participate, we'd like to hear from you. And if the results of this survey raised any issues for you, write in. The newsletter is an ideal forum for constructive discussion.

TECHNOTES

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

A New Analytical Technique for Refining the Dating of Obsidian

Infrared spectroscopic determinations of the intrinsic water found in obsidian artifacts provide additional data that are thought to contribute to a refinement in their dating. Analyses made on the same sample wedge cut for hydration rim measurement prior to grinding and production of the optical thin section, are used to estimate the obsidian hydration rate constants for each artifact. Using the results,

Table 1. PROFILES OF OBSIDIAN HYDRATION LABORATORIES

Laboratories:	Contacts:	Services Available:
Obsidian Hydration Laboratory The Institute of Archaeology University of California, Los Angeles Los Angeles, California 90024	Dr.Glenn Russell Nicholas Gessler (310) 206-2171 (310) 206-4723 (FAX)	OH measurements, XRF characterization.
Obsidian Hydration Laboratory Anthropological Studies Center Sonoma State University Rohnert Park, California 94928	Thomas M. Origer (707) 664-2381	OH measurements
Jonathon E. Ericson, PhD, Consultant 27842 Via Estancia San Juan Capistrano, California 92675	Dr. Jon Ericson (714) 248-9471	OH measurements; retouch microsamples are measured using micro-manipulation techniques; source determination using INAA & multivariate analysis.
Obsidian Hydration Laboratory Dames & Moore 60 Declaration Drive, Suite B Chico, California 95926	Kathleen L. Hull (916) 893-9675 (916) 893-9682 (FAX)	OH measurements.
Obsidian Hydration Laboratory Department of Anthropology California State University, San Jose San Jose, California 95192	Dr. Thomas Layton Glen Wilson (408) 924-5542	OH measurements.
Lithic Research Center Department of Anthropology California State University, Chico Chico, California 94929-0400	Lisa Swillinger (916)898-4413 (916) 898-6824 attn. Colusa 103 BDREYER@OAVAX.CSUCHICO.EDU	OH measurements; XRF source determinations.
Diffusion Laboratory P.O. Box 02095 Columbus, Ohio 43202	Dr. Chris Stevenson (614) 268-2514 (614) 268-7881	XRF source determination subcontracted out; Soil temperature & Rh monitoring cells; Infrared water content determinations; Experimentally derived hydration rates; Calendric dates.
Geochemical & Obs. Hydration Studies BioSystems Analysis, Inc. 1017 Front Street, Suite 200 Sacramento, California 95814	Dr. Thomas L. Jackson Robert J. Jackson Kim Tremaine (916) 557-4500 (916) 557-4511 (FAX)	OH measurements; XRF source determinations.
Obs Hydration Measurement Service 5728 Calmor Avenue, Suite 4 San Jose, California 95123	Jeffrey A. Hamilton (408) 578-9034	OH measurements; Video taped microscopy sessions; Computerized Image Analysis; Visual database of samples & measurement loci; North Coast Range Obs. Visual Sourcing; Field Ready Lab

artifacts from a similar context may be partitioned into groups which hydrate at similar rates thus facilitating comparative studies. Also, the water analysis procedure alleviates the working assumption that all obsidian from the same geological flow or quarry are equivalent with respect to water composition. It is anticipated that this enhanced control over this critical variable will produce even better results for users of the dating method. Persons wishing to discuss applications should contact Christopher Stevenson, Ph.D., Diffusion Laboratory, 4620 Indianola Ave., Columbus, OH 43214. Phone: (614) 268-2514 FAX: (614) 268-7881.

MEETINGS AND EVENTS

Compiled by Dr. M. Steven Shackley, of the Phoebe Hearst Museum of Anthropology, 103 Kroeber Hall, University of California, Berkeley, CA 94720 USA; (510) 642-3681; FAX 643-8557. BITNET: Shackley@ UCBCMSA. Internet: Shackley@cmsa.berkeley.edu

October 1992

Oct. 21-24. Southeastern Archaeological Conference. Little Rock, Arkansas, USA. John H. House, Program Chair, P.O. Box 136, UAPB, Pine Bluff, AR 71601, USA; 501-535- 4509.

Oct.26-29. Geological Society of America, Annual Meeting. Cincinnati, Ohio, USA. Geological Society of America, 3300 Penrose Place, Boulder, CO 80301, USA. (303) 447-2020.

November 1992

Nov. 5-8. Eastern States Archaeological Federation, 59th Annual Meeting, Pittsburgh, PA, USA. Richard L. George, Carnegie Museum Annex, 5800 Baum Boulevard, Pittsburgh, PA 15206, USA; 412-665-2600; fax 412- 665-2751.

Nov. 12-15. American Society for Ethnohistory. Salt Lake City, UT, USA. William Fowler, P.O. Box 6307- B, Vanderbilt University, Nashville, TN 37235, USA.

Nov. 15-20. American Nuclear Society. Washington, DC, USA. Meetings Department, ANS, 555 N. Kensington Ave., La Grange Park, IL 60525, USA. 312-352-6611.

Nov. 23-27. New Zealand Geological/Geophysical Society, Joint Annual Meeting. Christchurch. David Shelley, Department of Geology, University of Cantebury, Christchurch, New Zealand; 03-667-001; fax 03-642- 769.

December 1992

Dec. 2-6. American Anthropological Association Annual Meeting, San Francisco, California, USA. American Anthropological Association, 1703 New Hampshire Ave., NW., Washington DC 20009, USA (202-232-8800).

February 1993

Feb. 8-11. Geologic Remote Sensing Meeting. Pasadena, CA, USA. Nancy Wallman, ERIM, Box 134001, Ann Arbor, MI 48113 USA. 313-994-1200 ext. 3234; fax 313-994-5123.

Feb. 11-16. American Association for the Advancement of Science, Annual Meeting. Boston, MA, USA. AAAS, 1333 H St. NW, Washington, DC 20005, USA (202) 326-6400.

April 1993

Apr. 7-11. Society for California Archaeology Annual Meeting. Asilomar, CA, USA. Society for California Archaeology, Department of Anthropology, California State University, Fullerton, CA 92634; 714-773-3977. **The Annual IAOS Business Meeting will take place during the SCA meeting.**

Apr. 11-17 Society for American Archaeology 58th Annual Meeting. St. Louis, MO, USA. Jay F. Custer, Department of Anthropology, University of Delaware, Newark, DE 19716 USA.

October 1993

Oct. 25-28. Geological Society of America, Annual Meeting. Boston, MA, USA. Geological Society of America, 3300 Penrose Place, Boulder, CO 80301, USA. (303) 447-2020.

1994

Apr. 11-15. Materials Research Society, Spring Meeting. Symposium: Materials Issues in Art and Archaeology IV. San Francisco, CA, USA. Materials Research Society, 9800 McKnight Road, Pittsburgh, PA, USA; 412-367-3012.

Jun. 5-11. Geochronology, Cosmochronology and Isotope Geology (ICOG-8). Berkeley, CA, USA. Garniss Curtis, Institute of Human Origins-Geochronology Center, 2453 Ridge Road, Berkeley, CA 94709 USA; 510-845-4003; fax 510-845-9453.

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 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; newsletters; 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 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 payment 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.

If you wish to join us, mail a check or money order to the IAOS:

Lisa Swillinger, Secretary-Treasurer

Department of Anthropology

California State University at Chico

Chico, California 95929-0400

(916) 898-6256

Call For Volunteers

We are looking for multilingual persons willing to translate IAOS material into other languages. Thanks to Viviana Inés Bellifemine, we now have both the IAOS flyer and membership application in Spanish ready for distribution.

Call For Articles and Information

Submissions for articles, reviews, short reports, abstracts, or announcements for inclusion in the next newsletter should be received by May 15, 1992. We accept electronic media on IBM compatible 3.5" or 5.25" diskettes, in a variety of word processing formats including Wordperfect (4.2 or 5.0), Wordstar, and Microsoft Word or ASCII text formats. A hard copy should accompany diskettes. Articles or Reviews: Send to Lisa Swillinger (address above).

Short Reports: If you are interested in briefly reporting on research findings (e.g., one column in length), contact Mike Rondeau at CALTRANS, Office of Environmental Analysis, 650 Howe Avenue, Suite 400, Sacramento, California 92825; (916) 920-7458; FAX (916) 920-7149.

Abstracts & Annotations: If you are interested in submitting an abstract or annotation, please contact Kim Tremaine at BioSystems Analysis, 1017 Front Street, Sacramento, California 95814; (916) 557-4500; FAX (916) 557-4511.

Meeting and Events: If you have any information on upcoming conferences or other events, please keep Dr. Steven Shackley informed. He can be reached at the Phoebe Hearst Museum of Anthropology,103 Kroeber Hall, University of California, Berkeley, CA 94720 USA; (510) 642-3681; FAX 643-8557; BITNET: SHACKLEY @ UCBCMSA.

IAOS Officers, 1992-1993

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