



IAOS

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NEWS AND INFORMATION

CALL FOR PAPERS

Please consider joining an IAOS sponsored session on long distance exchange at the 2006 Society for American Archaeology meetings in Puerto Rico. If interested, please contact Carolyn Dillian at cdillian@crcg.net or stop by the IAOS meeting in Salt Lake City.

IAOS ELECTIONS

If you have not yet voted for your candidate for the position of President of the IAOS for inauguration during our annual meeting at the SAAs in 2005, please review the election materials enclosed with this *Bulletin* and complete and send the ballot on the last page. You can also vote electronically by sending an email with your vote to Janine Loyd at iaos@origer.com

RECENT OBSIDIAN PUBLICATIONS

Liritzis. I, Diakostamatiou. M, Stevenson. C. M, Novak. S. W, Abdelrehim. I (2004) Dating of hydrated obsidian surfaces by SIMS-SS. *Journal of Radioanalytical and Nuclear Chemistry*, Vol.261, No.1, 51-60.

2005 IAOS ANNUAL MEETING

The IAOS Annual Meeting will be held during the Society for American Archaeology meetings in Salt Lake City, Utah, USA. The IAOS meeting is scheduled for April 1, 2005, 3:30-4:30pm. Please consult your SAA program for location information.

NOTES FROM THE PRESIDENT

Happy New Year! Thanks to all of you who have expressed renewed interest in the IAOS and who have responded to my first attempt at preparing the IAOS *Bulletin* with Volume #31. I appreciate all of your comment and feedback, and look forward to receiving more suggestions for articles, abstracts, and research notes. Keep it coming! This will be my last correspondence as IAOS President, as we will be recognizing a new IAOS President at our annual meeting in Salt Lake City. I encourage all of you to attend our business meeting on Friday, April 1, 2005 during the Society for American Archaeology meetings in Utah. Watch your SAA program for room details. Also, please consider nominating obsidian papers for our new award: this is an award for obsidian-related papers presented during conferences or meetings. The award consists of a two-year membership in the IAOS and publication of the paper in the IAOS *Bulletin*. If you have a paper you wish to nominate, please send the following information to me at cdillian@crcg.net

- Name and affiliation of nominee
- Title of paper
- Conference where presented

We hope that this award will be an effective means to round out our membership, particularly with student members. We appreciate any help you can provide!

Happy New Year and all the best for 2005!

Sincerely,
Carolyn Dillian

ELECTIONS

We have one nominee for the position of President of the International Association for Obsidian Studies. Please read the candidate's statement below and cast your vote using the ballot enclosed at the end of this *Bulletin* or by email to iaos@origer.com

Philippe D. LeTourneau
BOAS, Inc. and Department of Anthropology,
University of New Mexico

I am running for election to be President of IAOS because I want to contribute to this important organization's continued growth. As President, my goal would be to help build on what I see as the IAOS' three major strengths:

- the core, dedicated membership that has been its backbone since 1989,
- the excellent newsletter that keeps us up to date on a broad range of current obsidian research,
- the extremely well run website that serves as a central resource for obsidian researchers.

IAOS has seen significant recent improvements in all of these areas, and I intend to build on this forward momentum. In the upcoming two years I would also expand on IAOS' recent successes in broadening its international connections.

I received a PhD from the University of New Mexico in fall 2000 with a dissertation on Folsom raw material procurement that allowed me to focus on my two primary research interests – Paleoindian archaeology and raw material sources. My interest in raw material sources is to better characterize their geologic and geographic locations as well as their physical and chemical characteristics to allow for better understanding of regional mobility and exchange. My research on obsidian sources, specifically, has focused on northern Chihuahua, southern New Mexico, and central New Mexico. In Seattle, I am Principal Investigator at BOAS, Inc., a CRM firm, as well as part-time archaeology faculty at Seattle Central Community College. I also have an appointment as Adjunct Assistant Professor in the University of New Mexico Anthropology Department.

How Homogeneous is the “East Göllü Dağ” (Cappadocia, Turkey) Obsidian ‘Source’ Composition?

G. Poupeau¹, S. Delerue¹, T. Carter², C.E. de B. Pereira³, N. Miekeley⁴ and L. Bellot-Gurlet⁵

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It has long been recognized that the south Cappadocian strato-volcano of Göllü Dağ was a major obsidian source for the Neolithic Near East, exploited from the 12th millennium BP onward (Chataigner et al., 1998). Although many elemental analyses of Göllü Dağ samples have been undertaken since the mid-1960’s (Renfrew et al., 1966), it remains that the geochemistry of these obsidians is not yet satisfactorily known. In part, this is due to the difficulty of comparing data accumulated over 40 years, the measurements produced by different methods in different laboratories, in conjunction with the limited number of samples analysed per source (Poidevin 1998). In the most recent major study of the Göllü Dağ massif, six main obsidian outcrops were distinguished (**Figure 1**). Fission-track dating by Bigazzi and colleagues showed that subtle but significant age differences exist between five of these outcrops between 1.15 and 1.48 Ma (Bigazzi et al., 1998, Yegingil et al., 1998). Using previously generated elemental data together with that from his own ICP analyses, Poidevin (1998) divided the six Göllü Dağ obsidians outcrops into two compositional groups. His “West Göllü Dağ” group comprised the obsidians from Kayırlı-village, Nord Bozköy and Gösterli, based on the geochemical similarities of samples from the first two outcrops (especially their Ba, Th, La and Ce contents). At that time, the inclusion of the Gösterli obsidians to this group relied only on two analyses of their major elements. The obsidians of this group were observed to have a greater geochemical affinity to

those of the north Cappadocian Acigöl ante-caldera group than with the obsidians of “East Göllü Dağ” (hereafter referred as EGD). The definition of the EGD group was based on the “identical chemistry” of the Kayırlı East and Kömürçü obsidians (Poidevin 1998). Although a limited number of analyses on obsidians from Sirça Deresi were available, they exhibited a narrow chemical affinity with those of East Kayırlı and Kömürçü. For this reason, Poidevin proposed to include the obsidians from each of these three locations in a single EGD group.

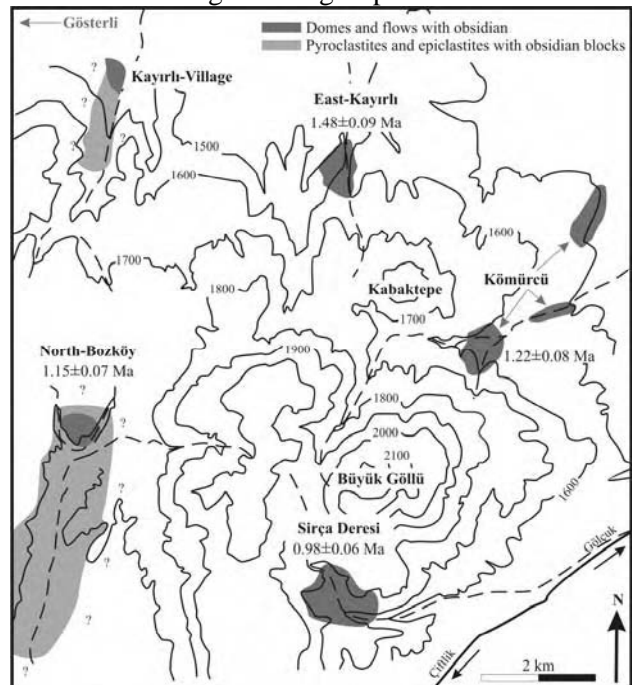


Figure. 1: Schematic map of the Göllü Dağ volcano with the location of the main obsidian outcrops (modified, from Poidevin 1998).

Since 1996 the CNRS group has been involved in Near East Neolithic obsidian provenance studies based on elemental analyses by ICP-AES and ICP-MS (Martinetto, 1996, Bellot-Gurlet, 1998, Abbès et al., 2001, 2003). From 1999 this work has included a major program dedicated to the ICP sourcing of artefacts from the famous Neolithic site of Çatalhöyük in central Anatolia (Carter et al., 2001, 2005). We have currently analysed 101 samples from cultural levels IX-IV (Early Neolithic), a period of approximately 500 years, c. 7000-6500 BC. On the basis of major and trace element contents three obsidian groups were defined, corresponding to an EGD origin (55

samples), a Nenezi Dağ origin (45 samples) plus one sample of a currently unknown source (Carter et al., 2005). The elemental composition of each of the first two groups was very homogeneous. However, in the samples with an EGD-type composition one can observe a rough co-variation of Ba and Sr, as shown in **Figure 2**. Such a trend had been observed previously by Bellot-Gurlet (1998) from data obtained by him and by Martinetto (1996), on 69 artefacts from various Neolithic sites of the Middle Euphrates valley characterized as having an EGD-type composition. It is important to note that all of these data were obtained from the analytical procedures described in Bellot-Gurlet et al. (1999).

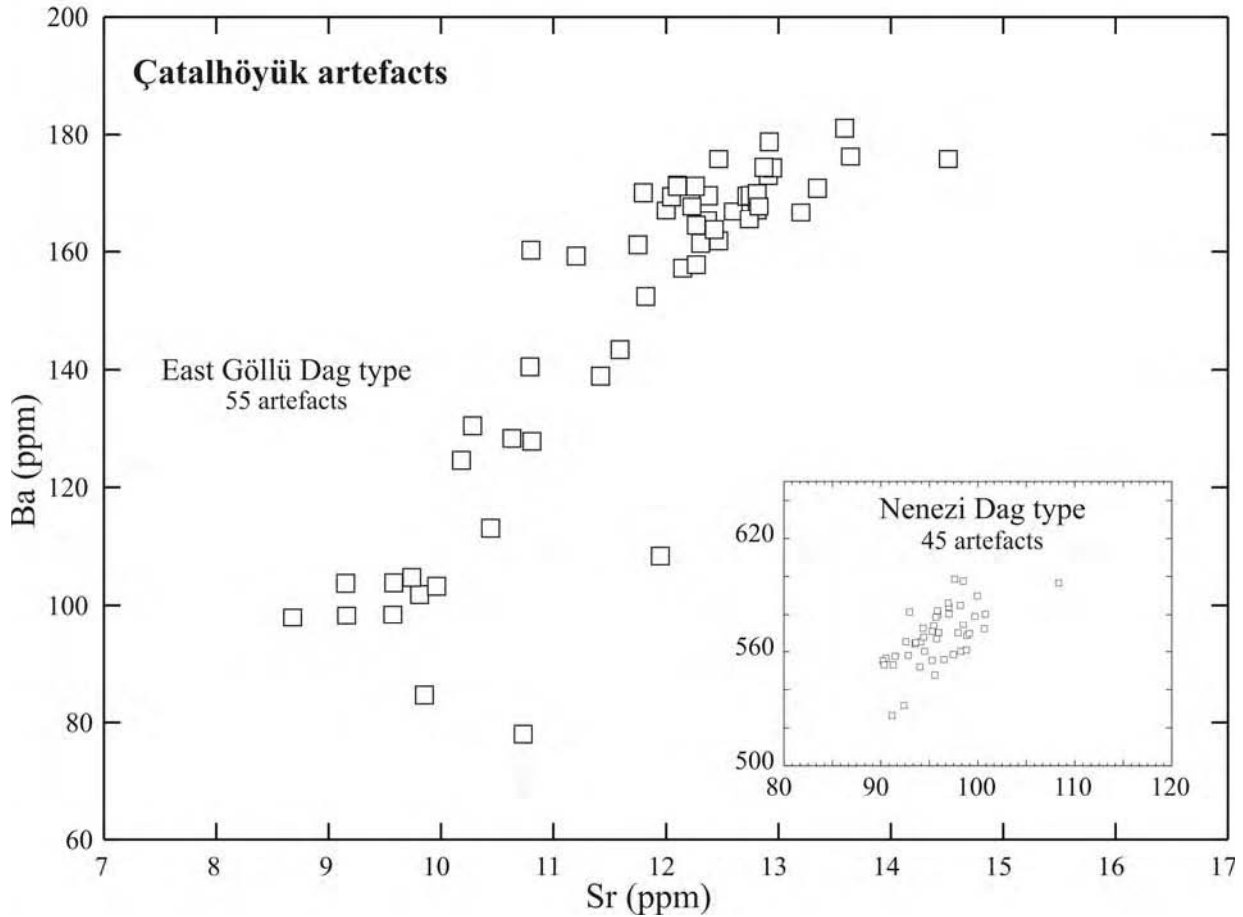


Figure 2: Binary Ba .v. Sr contents for 100 Çatalhöyük artefacts as determined by conventional (solution) ICP-MS (Carter et al., 2001, 2005).

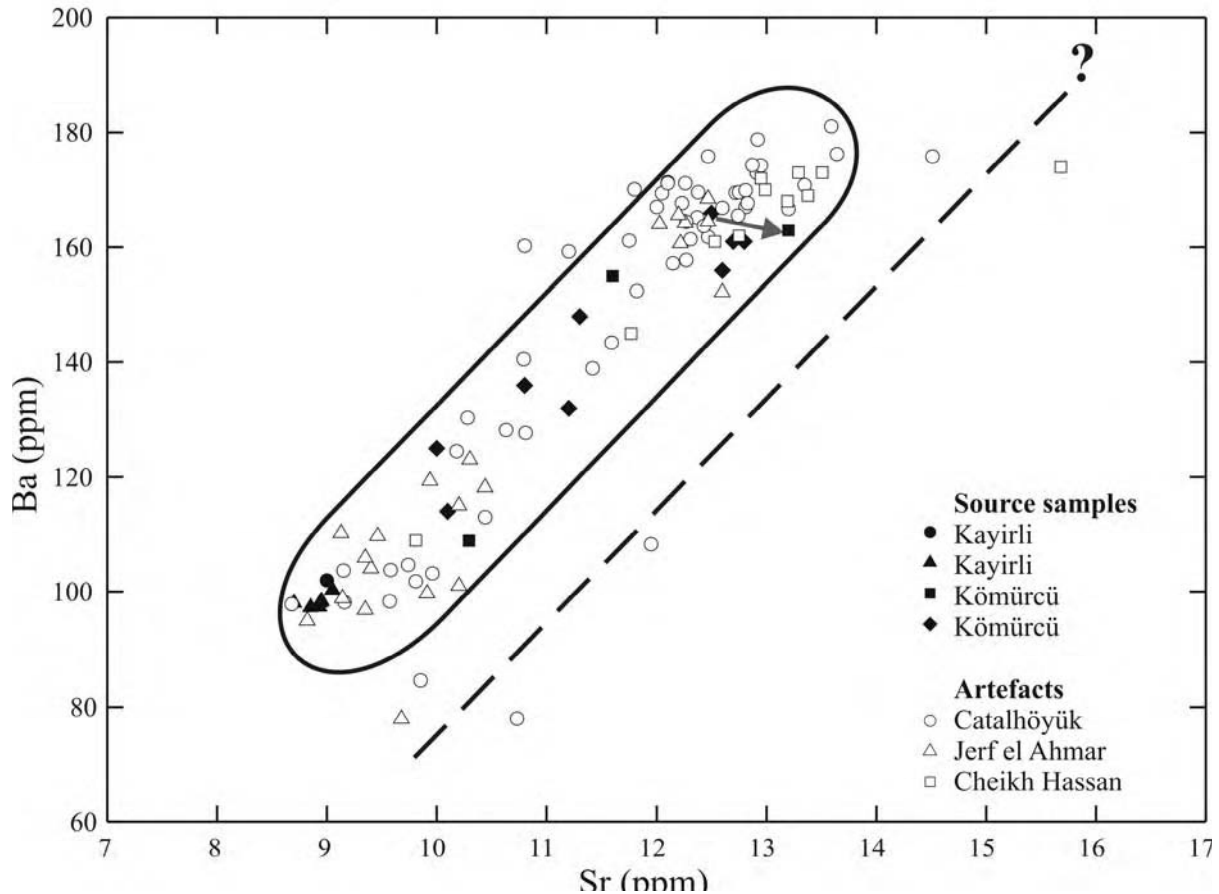


Figure 3: Distribution of Ba and Sr contents in 128 artefacts with an EGD geochemical type from the Middle Euphrates sites Cheikh Hassan (Abbès et al., 2001) and Jerf el Ahmar (Abbès et al., 2003), and from Çatalhöyük (same as in Figure 2) compared with that obtained on 17 Göllü Dağ obsidians from the Birtlikeler hill (“East Kayırlı” source) and the Komürçü “C” flow (see text). All artefacts and the source samples marked by a black triangle or square were analysed in Grenoble by ICP-MS following the experimental procedure described in Bellot-Gurlet et al. (1999). The Kayırlı sample (black dot) was analysed by the same technique in Southampton and nine C flow (Kömürçü) samples (black diamond) by the Pereira (2000) procedure in Rio de Janeiro. The arrow joins two measures on aliquots from a single Kömürçü sample.

Using the same procedures, our group analysed several geological samples from two of EGD’s major obsidian outcrops, namely the East Kayırlı (Bitlikeler hill) (six samples) and the “C” lava flow of Kömürçü (three samples) (Martinetto, 1996, Bellot-Gurlet, 1998, Abbès et al., in preparation). Ten EGD samples from the C flow were also analysed by ICP-AES and ICP-MS by Pereira, Miekeley and Poupeau (unpub. data) following the procedure described in Pereira (2000); two C flow samples were analysed in both laboratories. One of the East Kayırlı samples was analysed both by Bellot-Gurlet at Grenoble

(1998) and by Barrat, Delerue and Milton at Southampton (2004, unpub. data). All of these samples are remarkably similar in composition, apart from a co-variation in the Ba and Sr content. As shown in **Figure 3** most EGD-type artefacts from Çatalhöyük, and from the Middle Euphrates valley PPNB sites of Cheikh Hassan (Abbès et al., 2001) and Jerf el Ahmar (Abbès et al., 2003) follow the same elemental trend as the geological samples in a Ba vs. Sr content diagram, while some others might follow a parallel trend (**Figure 3** and our unpub. data). The fact that the artefacts’ compositional field(s) is (are) more extended than

that relative to geological samples might simply reflect the small number of source samples that we measured. In particular, it should be noted that we did not analyse any samples from the Sirça Deresi outcrop.

The most important homogeneous data bank on the EGD obsidian sources, to our knowledge, is that published by Yellin (1996), based on 63 samples taken from the three main EGD obsidian outcrops, using neutron activation to determine 19 element contents. In this work, Yellin observed sample to sample variations in Ba and in a lesser extent in the Eu content. Unfortunately, Sr was not determined in this work. The other element contents found in his samples are in good to very good agreement with ours. Based on Ba and Eu content variations, Yellin defined three discrete groups, GLD-A, -B and -C. While obsidians of his GLD-A (11 samples) type came mostly from the southern area of 'Sirça Deresi', obsidians of the GLD-C (46 samples) type are essentially found in the Kömürcü area. However, in each group, some outliers come from the two other main source areas of EGD. Finally, obsidians of the GLD-B type (six samples) appear to be equally present in the three EGD main source areas. The ICP data obtained by our group on nearly 250 archaeological artefacts (**Figure 3** and unpub. data) suggest that a continuous variation of Sr and Ba exists among the EGD obsidians, their contents ranging between 8-16 ppm and 70-180 ppm respectively. This is in agreement for Ba with the range of contents observed by Yellin in EGD samples.

The slight Eu content variations in EGD obsidians observed by Yellin (1996) was also observed in EGD-type artefacts by Bellot-Gurlet (1998), who showed the existence of a trend between the Sr content and the Eu anomaly intensity. A similar trend is observed in our Çatalhöyük artefacts (Carter et al., 2005, table 12-5) and in other yet unpublished data on EGD samples and EGD-type artefacts. As for Ba and Sr contents, no clear correlation appears yet between the Eu anomaly and sample location on the East Göllü Dağ.

In conclusion, we found that among the 36 elements that we routinely determine by conventional (solution) ICP (Al, Fe, Mn, Mg, Ca, Na, K, Ti, P, Co, Rb, Sr, Y, Zr, Nb, Cs, Ba, Hf,

Ta, Pb, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu Th and U), only three, Sr, Ba and the Eu were found to have relatively large content variations in the archaeological artefacts of EGD-type. These elements exhibit from sample to sample a continuous correlated co-variation. The EGD samples we measured allowed us to observe similar trends, albeit more restricted. This is at least partly due to our very limited geological "data bank" (<20 samples) compared to that of EGD-type artefacts (>200). Interestingly enough, in our geological samples, the Ba and Sr contents are always higher in Kömürcü samples than in East Kayırlı samples. The same observation can be made about Sr in the data previously obtained by Gratuze (as reported in Poidevin, 1998, Annexe II) by laser-ablation ICP-MS on six Kömürcü and 13 East Kayırlı samples; although his highest and lowest Ba contents are respectively found in Kömürcü and East Kayırlı samples, their ranges, of 128-216 ppm and 73-180 ppm partly overlap. At this time, it can be suggested provisionally that the artefacts in **Figure 3** with the highest Sr and Ba contents might have a greater probability of coming from the Kömürcü source-area, while those with low Sr and Ba might rather be related to East Kayırlı. Clearly, more EGD source samples need to be analysed, not least a selection from Sirça Deresi, in order to confirm what, at present, are tentative suggestions.

In a further attempt to discriminate between the various outcrops that currently make up the EGD 'source', we have started another ICP program based on the determination of 50 elements by conventional ICP (Pereira, Miekeley and Poupeau, unpub. data). In addition to most of the above-cited elements, we determined in the ten C flow samples, 14 additional elements (Li, Sc, Ni, Cu, Zn, Ga, Ge, As, Mo, Ag, Cd, Sb, W, Tl and Bi) whose contents were found not to vary significantly between samples. Thus given our current state of knowledge concerning the elemental composition of East Göllü Dağ obsidians, it might be a little too early to try to assign an archaeological obsidian to a specific EGD source area. A detailed geochemical mapping of primary and secondary source areas is still required, in conjunction with an increased compositional data-bank of geological samples, before we can further develop these important lines of enquiry.

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CAST YOUR VOTE FOR IAOS PRESIDENT

All IAOS members are encouraged to vote for officers. We currently have one candidate for IAOS president for the 2005-2007 term. You may cast your vote via snail mail, by detaching and mailing this form, or via email.

President:

_____ **Philippe D. LeTourneau**

BOAS, Inc. and Department of Anthropology, University of New Mexico

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**Highlights from the 2003 International Specialized Workshop:
Recent Advances in Obsidian Dating and Characterization, Melos, Greece**

Organized by the Laboratory of Archaeometry, University of the Aegean
and the International Association for Obsidian Studies

In forthcoming *Bulletin* issues, we are pleased to present highlights and abstracts from the 2003 *International Specialized Workshop: Recent Advances in Obsidian Dating and Characterization* held in Melos, Greece. The conference was organized by Professor Ioannis Liritzis of the Laboratory of Archaeometry at the University of the Aegean, with the assistance of Dr. Carolyn Dillian of the IAOS. IAOS served as a co-sponsor of the event. The conference was designed to address the current status and research potential of obsidian hydration dating and chemical characterization. Since the 1960's, when hydration dating first appeared, the method has proven useful to archaeologists, although unsatisfactory results have frequently occurred. The reason for this uncertainty relies on several factors: a) a limited understanding of the water diffusion in obsidian, b) the unknown temperature and humidity history of the hydration environment, and c) interpretation of site depositional context and sampling. During the last five years, the dating of obsidian has focused on modeling the concentration-dependent diffusion process. The development of this approach as well

as experimental evidence on water diffusion in obsidian and glass in general, may establish appropriate mathematical expressions, which will make the method essentially intrinsic and independent of environment factors, since they are embedded within the diffusion equations. These and other new developments were explored. As dating is closely related to the distribution and transportation of obsidian, particular presentations addressed questions regarding characterization (and thus provenance) focusing on the Aegean, Mediterranean, Pacific, United States, and other parts of the world. Therefore, up to date reviews and current results of recent archaeological excavations, chemical analyses with physical methods, and usewear analyses were presented. Papers will be published as special issues in the *Journal of Mediterranean Archaeology and Archaeometry*

(www.rhodes.aegean.gr/maa/journal).

-Editor's note: Conference description paraphrased from conference notes previously published by Prof. Ioannis Liritzis as part of workshop abstracts.

ABSTRACTS

Oehler, A. (Intel Corp.) and M. Tomozawa (Rensselaer Polytechnic Institute)

Water Diffusion in Silica Glass at Low Temperatures

Water in glass has disproportionately large effects on various properties, such as the chemical durability and mechanical strength, of oxide glasses. Silica glass is the basis of many silicate glasses. Thus, there have been numerous studies on water diffusion into silica glasses. But most past research on water diffusion into silica glasses has been conducted at high temperatures, where water diffusion is accompanied by structural changes of the glass. In the present study, water diffusion into silica glass at low temperature, 200°C-350°C, under saturated water vapor pressures, was measured using IR spectroscopy as

the main research tool. It was found that both water solubility and diffusion coefficient were time dependent. Furthermore, both hydroxyl and molecular water were detected. From the concentrations of hydroxyl and molecular water, an apparent equilibrium constant, $K=[\text{SiOH}]^n/[\text{H}_2\text{O}]$ was evaluated. According to the studies of the reaction at high temperature, $\text{Si-O-Si} + \text{H}_2\text{O} \rightarrow 2 \text{SiOH}$, n should be 2. However, the value of n was 1 for silica glass at low temperature. This indicates that the two hydroxyls formed in the glass during the reaction are not independent after the reaction.

Suzuki, M. (Rikkyo University)

An Approach to the Palaeoclimatic Reconstruction Using Obsidian Hydration as a Temperature Indicator

Chronometric dating methods applicable to the late Quaternary period are categorized into three groups: 1. radiometric (AMS C-14, FT, K(Ar)-Ar, U-series, TL, ESR, etc.), 2. chemical (racemization and obsidian hydration (OH), and 3. biological and sedimentological (dendrochronology and varved clay) ones. In the last decade, the Tandetron C-14 dating method has increased its efficiency in widening a variety of datable materials and a time range from c. 30,000 a B.P. to 55,000 a B.P., chemical dating methods have gradually shifted their identity from an absolute dating method to a monitoring method of palaeotemperature fluctuation. For example, C-14 dates and coupled measurements of the racemization degree of emu eggs succeeded in suggesting a palaeoclimatic change during the late Quaternary period as reported elsewhere.

A project of comparative analysis of AMS C-14, FT (of burnt obsidian) and OH dates has been achieved, aimed at a calibration of C-14 dates over the time period of tree-ring calibration (up to c. 10,000 a B.P.) and a revelation of hydration rate change along the same time course.

A human utilization of obsidian in Japan dates back to c.40,000 a FT-B.P., the time range which covers a maximum stadial of the last glaciation (c. 20,000 a B.P.) and hypsithermal high-temperature periods (c. 6,500 a B.P.). When applied to this time period, the obsidian hydration method fails to manifest its potentiality as a chronometric dating method due to its temperature sensitiveness. For example, AMS C-14 dates fall in a range between 25,000 to 30,000 a B.P., and FT dates of burnt obsidians bear ages between 30,000 and 35,000 a B.P., whereas OH dates of associated obsidians show around 7,500 a B.P., roughly one fourth of FT or AMS C-14 dates.

This case study, coupled with precise accelerated hydration experiments in reactors that are temperature-controlled at elevated temperatures of e.g. 152, 126, and 104 degree Celsius, suggests a new potentiality of OH dating as a tool for reconstructing palaeoclimatic fluctuation during the Late Quaternary period.

Ambrose, W. (Australian National University)

Powdered Obsidian for Determining Hydration Rates and Site Thermometry

The two essential factors in the temperature related calibrations of obsidian hydration dating are firstly, the inherent temperature controlled diffusion rate and secondly, the integrated effective diffusion rate an obsidian specimen experiences over time at an archaeological site. Various procedures for determining these two factors have been adopted. For instance, high temperature rate inductions are used in association with analog ambient temperature monitoring; or secondary rates derived from radiometric calibration are used with site based radiation balance models. The lack of equivalence between different methods requires extrapolations that could be avoided if the same methodology was used for both measurements. By exposing obsidian powders to short term laboratory conditions at 10, 20, 30, and 40 degrees C, and hydration measurement by optical and SIMS methods of long-term obsidian flakes from the same source, exposed at the same temperatures, the inherent hydration rates can be determined. The second factor of site effective hydration temperatures may also be determined using obsidian powders. Experimental powder cells were implanted for about a year at locations within archaeological sites in West New Britain, Papua New Guinea, but although they produced mixed results, the experiment shows that this is a feasible method for determining site effective hydration temperatures. The derivation of inherent hydration rates from obsidian powders requires the precise measurement of surface area to volume ratios, and the concentration of the diffusing species in the hydrated layer. This study also determines whether diffusion of H, OH or H₂O is responsible for the observed hydration rim.

Brodkey, R.S. (Ohio State University), I. Liritzis (University of the Aegean), and M. Diakostamatiou (University of the Aegean)
Molecular Transport Phenomena related to Obsidian Hydration Dating

Heat transfer, mass transfer, and fluid flow are not new topics. What is new is the descriptive term “transport phenomena.” The general approach is to formulate a mechanism, establish the equations, and solve them. The final results are tested in whatever ways that are possible to verify the validity of the approach. Applications to obsidian hydration dating (OHD) are in reality, no different.

There are several approaches that can be taken to OHD. The empirical method is in some sense the simplest, and requires only mathematical input and does not consider any rational theory. In this method, any good fitting equation would be a good candidate to represent the age of the sample. You accept whatever correlation you get between the parameters and the age. You then apply the same parameters and equations to other samples and see how good you do, since you know the age. More often than not, you will not do all that well, because this method does not contain any understanding of the physics of the transfer. It works only because you might have a lot of data and can get a reasonable statistical correlation with the training sample. It is a simple approach, but does not often work, if the number of cases available is small as a result of inadequate statistics. The method does not, of course, provide any understanding of the mechanism.

At the other end of the spectrum of approaches is the scientific method. It is the ideal approach to the problem of the dating technique. We assume that we must understand the basic underlying diffusion process so that we can use it for the dating of obsidian samples: any samples from anywhere and of any age. Only if we understand the process in terms of the physics (or basic mechanism), can we do this. For this, the mechanism for obsidian dating is assumed to be simply Fickian diffusion. The diffusion coefficient, D , can be nearly constant for equal molar counter diffusion in dilute solutions; however, for solids this is not true. If the form of D is specified, there are many known solutions (both analytical and numerical) in the literature.

In the middle of the road approach is called the phenomenological method, and forms an extension of an earlier development (obsidian diffusion dating by SIMS-SS [Liritzis and Diakostamatiou 2002 in *Mediterranean Archaeology & Archaeometry*, vol. 2, No. 1, 3-20]). Here we base our analysis on the full concentration versus hydration depth curve (obtained by SIMS) and use transport by Fickian diffusion with a variable D , even if we cannot determine the constants fundamentally. We use all the cases (from SIMS) and correlate the data to get the best fit using the theory. This establishes the unknown constants. The concept uses simple rational equations that are based in theory and used experiments to determine in a known manner any parameters in the theory. This can then be subsequently used as a tool to predict other ages from SIMS data. It is this approach that is discussed in this paper.

AWARDS

The IAOS has instituted a new award for obsidian-related papers presented during conferences or meetings. The award consists of a two-year membership in the IAOS and publication of the paper in the *IAOS Bulletin*. If you have a paper you wish to nominate, please send the following information to Carolyn Dillian at cdillian@crcg.net

- Name and affiliation of nominee
- Title of paper
- Conference where presented

MEMBERSHIP

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

Regular Member: \$20/year*

Institutional Member: \$50/year

Student Member: \$10/year or FREE with submission of a paper to the *Bulletin* for publication. Please provide copy of current student identification.

Lifetime Member: \$200

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

Institutional Members are those individuals, facilities, and institutions who are active in obsidian studies and wish to participate in interlaboratory 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 and/or waived in cases of financial hardship or difficulty in paying in foreign currency. Please complete the form and return it to the Secretary-Treasurer with a short explanation regarding lack of payment.

NOTE: Because membership fees are very low, the IAOS asks that all payments be made in U.S. Dollars, in international money orders, or checks payable on a bank with a U.S. branch. If you do not do so, much of your dues are spent in currency exchange. Thanks for your assistance in this matter.

For more information about the IAOS, contact our Secretary-Treasurer:

Janine Loyd
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iaos@origer.com

Membership inquiries, address changes, or payment questions can also be emailed to iaos@origer.com

ABOUT THE IAOS

The International Association for Obsidian Studies (IAOS) was formed in 1989 to provide a forum for obsidian researchers throughout the world. Major interest areas include: obsidian hydration dating, obsidian and materials characterization ("sourcing"), geoarchaeological obsidian studies, obsidian and lithic technology, and the prehistoric procurement and utilization of obsidian. In addition to disseminating information about advances in obsidian research to archaeologists and other interested parties, the IAOS was also established to:

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

ABOUT OUR WEB SITE

The IAOS maintains a website at <http://www.peak.org/obsidian/>. The site has some great resources available to the public, and our webmaster, Craig Skinner, has recently included a members' only section.

The members' lounge has a message board for posting questions, keeping in touch, or updating fellow IAOS members about research. There is also a link for the IAOS listserv. Other items on our website include:

- World obsidian source catalog
- Back issues of the *Bulletin*.
- An obsidian bibliography
- An obsidian laboratory directory
- Photos and maps of some source locations
- Links

Thanks to Craig Skinner for maintaining the website. Please check it out!

CALL FOR ARTICLES

Submissions of articles, short reports, abstracts, or announcements for inclusion in the *Bulletin* are always welcome. We accept electronic media on IBM compatible disks and CD in a variety of word processing formats, but MS Word or WordPerfect are preferred. Files can also be emailed to the *Bulletin* at cdillian@crcg.net. Please include the phrase "IAOS Bulletin" in the subject line. An acknowledgement email will be sent in reply, so if you do not hear from us, please email again and inquire.

Deadline for Issue #33 is May 1, 2005.

Send submissions to:

Carolyn Dillian
IAOS *Bulletin* Editor
c/o CRCG
415 Cleveland Avenue
Highland Park, NJ 08904
U.S.A.

Inquiries, suggestions, and comments about the *Bulletin* can be sent to cdillian@crcg.net. Please send updated address information to Janine Loyd at iaos@origer.com.

MEMBERSHIP RENEWAL FORM

We hope you will continue your membership. Please complete the renewal form below.

NOTE: Due to our failure to produce a Winter 2004 *Bulletin*, all current and former IAOS members will receive a free 6 month extension on their membership.

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

Yes, I'd like to become a new member of the IAOS. A check or money order for the annual membership fee is enclosed (see below). Please send my first issue of the IAOS *Bulletin*.

Yes, I'd like to become a student member of the IAOS. I have enclosed either an obsidian-related article for publication in the IAOS *Bulletin* or an abstract of such an article published elsewhere. I have also enclosed a copy of my current student ID. Please send my first issue of the IAOS *Bulletin*.

Not convinced, but want to know more?

Please send me a complementary issue of the latest IAOS *Bulletin*.

NAME: _____

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

\$20 Regular

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FREE Student (include copy of article for *Bulletin* and student ID)

\$50 Institutional

\$200 Lifetime

Please return this form with payment to:

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