International Association for Obsidian Studies
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Assembled and edited by B. Hamusek

CONTENTS

NEWS AND INFORMATION

THE IAOS ANNUAL MEETING

The eight annual meeting of the IAOS will be held from 4:30 to 6:00 at the Marriott Hotel in New Orleans, Louisiana on Friday, April 12, 1996, in conjunction with the 61st annual meeting of the Society for American Archaeology.

Following a short business meeting at which the results from the recent election will be announced, incoming president Tom Jackson and Michael Glascock will lead a discussion regarding the members most current research. Various projects on which IAOS members can assist or collaborate with one another will be another topic of discussion. Details on the meeting's location will be found at the SAA Information Booth.

The Obsidian Sources Database Effort: Sources in Guatemala and Honduras as Examples

by Michael D. Glascock (University of Missouri)

In an earlier IAOS Bulletin you should have read about efforts that several IAOS members are making to compile information for a comprehensive descriptive database on obsidian sources (e.g., most common names, alternate names, source type, locations, geologic setting, visual and petrographic characteristics, chemical data, archaeological significance, literature references, etc.) The eventual goal is to make the database available to IAOS members either by PC diskette or through the WWW. Mike Glascock is compiling information on sources in the western; Roger Bird is taking care of sources in the South Pacific and eastern Asia; Robert Tykot is taking care of sources in the western Mediterranean and Europe; and George Rapp is taking care of sources in Turkey and the Near East.

As an example of the utility of such a database, names of confirmed obsidian sources in Guatemala and Honduras are tabulated below along with a listing of other known names that have been reported in the literature to identify these sources. A map showing the locations of these sources is shown in Figure 1. By standardizing in the use of the most common name for a source, we can help

eliminate the confusion generated when different names for the same source are used.

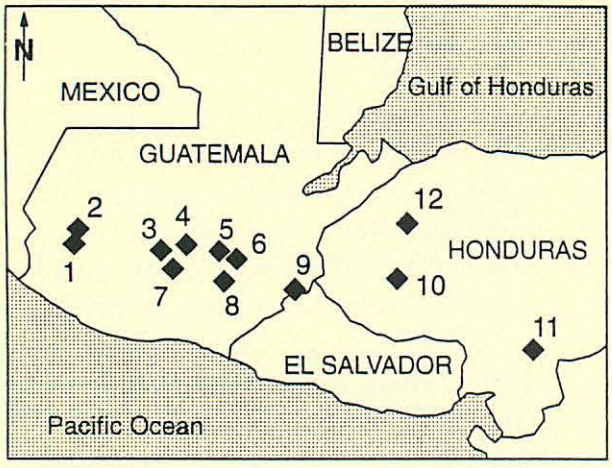

Fig. 1. Map of obsidian sources in Guatemala and Honduras.

Table I. Obsidian Sources in Guatemala & Honduras

Map	Most common name	Other names
1.	Palo Gordo	Tajumulco-1, San Marcos
2.	San Lorenzo	Tajumulco-2
3.	San Martin Jilotepeque	Aldea Chatalun, Rio Pixcaya, Pixcaya, Pachay, Choatalum,
	(6 subgroups)	Chimaltenango, Inyaalchay, Sauces, Type C, Las Burras
4.	El Chayal	La Joya, La Jolla, Palencia, Las Navajas
5.	Sansare	
6.	Jalapa	Los Mezcales
7.	San Bartolomé Milpas Altas	
8.	Media Cuesta	Lake Ayarza, Laguna de Ayarza, San Rafaelito
9.	Ixtepeque	Papalhuapa, Cerro Pino Redondo, Cerro Chaguitillo, Agua Blanca
10.	La Esperanza	Lake Yojoa, Lake Yajoa
11.	Güinope	
12.	San Luis (4 subgroups)	Agua Helada, Quebrada Agua Helada, Agua Sucia, Torreno

TECHNOTES

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

ON THE COUPLING OF PIXE AND FISSION TRACK DATING FOR OBSIDIAN SOURCING

by Ludovic Bellot-Gurlet*, Thomas Calligaro**, Olivier Dorighel*, Jean-Claude Dran**, Gérard Poupeau* and Joseph Salomon**

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**Laboratoire de Recherche des Musées de France, 6 rue des Pyramides, Paris 75041, France.

Provenience studies of obsidian artifacts rely on the observation that in general the chemical variations between different obsidian sources are larger than intra-source variations. It may, however, happen that two geographically distant sources are chemically difficult to differentiate as between the Bingöl and Nemrut Dag sources in Anatolia (Gratuze *et al*, 1993), or that a given source presents a variable composition as is the case for the Mullumica flow of Ecuador (Asaro *et al.*, 1994). In such cases, it may be useful to complete the geochemical characterization of obsidian by its dating (e.g. Bigazzi *et al.*, 1996 for Anatolia). We found that this geochemical/geochronologic approach, using PIXE and Fission Track Dating (FTD) might allow a better resolution in Colombian and Ecuadorian archaeological artifact sourcing studies.

PIXE analyses

The Ion Beam Analysis facility we use is the 2 MV tandem accelerator AGLAE of the *Laboratoire de Recherche des Musées de France*. PIXE analyses are made with a 0.5 mm diameter beam of 3 MeV protons, the measurements being performed in air with an external beam (Calligaro *et al.*, 1996). The samples are generally prepared as polished sections. However, precious artifacts can be analysed non-destructively and working outside the accelerator vacuum gives a greater flexibility in positioning such samples. The experimental set-up includes two Si(Li) detectors for the simultaneous detection of respectively low- and high-energy X-rays, corresponding to light ($8 < Z < 30$) and heavy ($Z > 30$) elements. In order to reduce X-rays attenuation by air a helium gas flux is injected in the gap between the beam impact spot on the sample and the low-energy X-ray detector. Backscattered protons, detrimental for the low-energy detector resolution, are deflected by a permanent magnet set up in front of this detector. The X-rays spectra are treated with the GUPIX software (Maxwell *et al.*, 1989). For each sample three spot analyses are made in order to overcome sample inhomogeneity. In obsidians we determine routinely 15 major and trace elements with a precision of 10% or better (at 2σ level).

Fission Track Dating

Obsidians are dated in Grenoble by the fission track method. Spontaneous fission tracks are often partially annealed, i.e. shortened, as a response to the ambient temperatures which prevail at the Earth's surface. This results in a variable lowering of obsidian ages. In order to take this effect into account, we determine plateau-ages following the procedure proposed by Storzer and Poupeau (1973). All non-devitrified obsidians of age >1 ka can be dated by fission tracks. The precision on a fission track age is controlled by the spontaneous track density (number of tracks/cm^2). It varies roughly from $\pm 10\%$ for the youngest ones to $\pm 5\%$ for ages >100 ka (1σ). Our experimental procedures are described elsewhere (Dorighel *et al.*, 1994).

The fission track age of an obsidian artifact is usually that of its source material. However, it may happen that an artifact burnt in a hearth or a natural fire at several hundred degrees Celcius looses all its pre-existing spontaneous fission tracks. Therefore, artifacts with annealing-corrected fission track ages equal to lower than that of the site they come from are not to be considered in provenience studies. Limitations to fission track dating, in addition to devitrification, may come from the presence of bubbles, inclusions and other glass defects, whose shapes and abundance may make track identification a real challenge. Opacity of some obsidians makes also FTD a difficult task.

A PIXE/FTD case study in Colombia and Ecuador

We are working on an obsidian sourcing project in Colombia and Ecuador. Thanks to an European and American network of archaeology and geology collaborators, we have presently more than 900 artifacts from 62 archaeological sites belonging to the Formative to Integration periods, i.e. from about 3500 BC to 1500 AD. To date, we have analysed by PIXE obsidians of six Ecuadorian sources from the *Sierra de Guamani*, to the SE of Quito and that of Rio Hondo, near to Popayan, in southern Colombia (Figure 1).

Figure 1. Location of the obsidian sources cited in the text. Triangles. Black triangles : Tumaco-La Tolita culture sites of which at least one artefact is in the shaded area of Figure 2.

We found that these sources are easily distinguished by PIXE analysis and as already shown by Asaro *et al.* (1994) that obsidians from the Mullumica flow presented variable compositions (Figure 2).

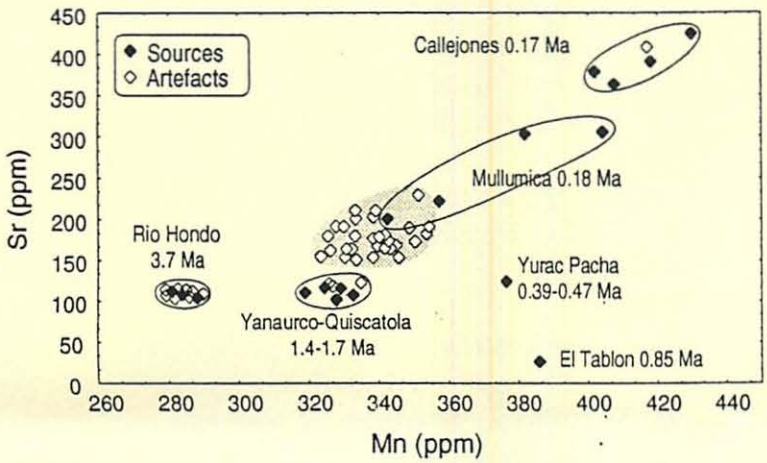

Figure 2. Plot of strontium versus manganese for various obsidian sources and artifacts. The six sources are identified by their ages (Bigazzi *et al.*, 1992) and names. Artifacts in the shaded area are all from the Tumaco-La Tolita culture.

Among the artifacts analysed up to now, some might apparently, on the basis of chemical proximity, be attributed to a given source. However, FTD shows that some artifacts compositionally close to a given source may differ from it in terms of age. This is the case for instance for one artifact with an age of 0.42 Ma, chemically close to the Callejones source which is dated at 0.17-0.18 Ma (see Figure 2). Clearly, such an artifact cannot come from this source. This and another example are discussed in Dorighel *et al.* (1996). It would remain in such cases to investigate whether chemical proximity between one artifact and a known source might or not correspond to a geographical vicinity between this source and the source of the artifact. This calls for more detailed field studies of some source areas.

A large group of artifacts from various coastal sites of the Tumaco-La Tolita culture defined in Figure 2 a domain secant -which is not an effect of representation- with one source domain, that of the Mullumica flow. As the end members of the Mullumica domain are not precisely known, it is unclear from geochemical data alone whether or not the source of all or a fraction of these artifacts has to be attributed to Mullumica.

FTD assigns the Mullumica flow an age of 0.17-0.18 Ma (Bigazzi *et al.*, 1992 and our unpublished data). On the contrary, the apparent fission track ages of 13 artifacts coming from the Tumaco-La Tolita coastal sites of Figure 1 dated so far are all older than that of the Mullumica flow. In all of these artifacts the spontaneous fission tracks are partially annealed, and the plateau-ages already determined on 7 samples are around 0.3 Ma. This age is older than that of the Mullumica flow and therefore excludes a Mullumica origin (Dorighel *et al.*, 1996).

Although our obsidian sourcing project in Colombia and Ecuador is still in a preliminary phase, FTD already appears as a useful complement to PIXE (or more generally geochemical) characterization. We would be very interested to extend our collaborations with other colleagues involved in obsidian artifacts sourcing studies in Andean and other, - Mediterranean-countries, as well as to increase sample exchanges for laboratory intercalibrations.

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AUSTRALASIAN ARCHAEOMETRY: RETROSPECTIVES FOR THE NEW MILLENNIUM: CALL FOR PAPERS

The Sixth Australasian Archaeometry Conference will be held at the Australian Museum, Sydney from 10-13 February 1997. As this will be the last official meeting on Australasian archaeometry this millennium, the Conference will present an overview of the current status of archaeometry, major achievements, recent advances, and applications. For this purpose, archaeometry is defined in the broadest context and contributions are sought from as wide a field as possible. We expect that as at previous conferences, there will be a major session devoted to obsidian studies including dating, characterization, use-wear and residues.

At this early stage of planning, the organizing committee invites contributions in the form of major reviews of techniques and applications as well as suggestions for paper and poster session on significant thematic issues that place importance on inter-disciplinary studies.

Suggested themes to date include:

1. Human colonization of Australasia and Oceania.

2. Extinction: its causes and timing.

3. Natural resources, production, trade and exchange in a worldwide perspective.

Academic sessions will be held at The Australian Museum and there will be a one day visit to the AMS and other facilities at ANSTO including a BBQ and business meeting to consider the organization of the archaeometry community in Australasia, national facilties, etc. As with previous conferences distinguished overseas visitors will present public lectures in association with the conference.

To receive the Second circular and registration materials, please send your name and address to:

Secretariat
Sixth Australasian Archaeometry Conference
AINSE
PMB 1
Menai NSW 2234
Australia

Send ideas for sessions, review papers, or paper abstracts to the Academic program chairmen:
Dr. Claudio Tuniz, AINSE (as above); Tel (61-2-7173493); Fax (61-2-7179256); e-mail: tuniz@atom.ansto.gov.au
or
Dr. Richard Fullagar, Division of Anthropology, The Australian Museum, 6 College Street, Sydney South NSW 2000, Australia. Tel (61-2-3206147); Fax (61-2-3206058); e-mail: richardf@amsg.austmus.oz.au

MEETINGS AND EVENTS

1996

April 3-7. Society for California Archaeology Meeting. Red Lion Hotel, Bakersfield, California. USA.

April 10-14. The 61st Annual Meeting of the Society for American Archaeology. Marriott Hotel, New Orleans, Louisiana, USA.

May 1-5. The 29th Annual Conference of the Canadian Archaeological Association. Delta Barrington Hotel, Halifax, Nova Scotia. Stephen Davis, Conference Coordinator, Department of Anthropology, St. Mary's University, Halifax, Nova Scotia, Canada B3H 3C3, (902) 420-5361, *or Rob Ferguson*, Program Coordinator, Parks Canada, Historic Properties, Halifax, Nova Scotia, Canada B3J 1S9, (902) 426-9505; Email: rob_ferguson@pch.gc.ca.

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

September 8-14. The XIII International Congress of the Union of Prehistoric and Protohistoric Sciences. Forli, Italy. Sarah Milliken, c/o Segreteria XIII Congresso U.I.S.P.P., Via Marchesi, 1, 47100 Forli, Italy; Fax: 39-543-35805.

1997

February 10-13. Sixth Australasian Archaeometry Conference. Australian Museum, Syndey, Australia. Austalian Institute of Nuclear Science and Engineering, Australian Nuclear Science and Technology Organization, Australian Museum. Dr. Claudio Tuniz, Sixth Australian Archaeometry Conference, AINSE, PMB 1, Menai, NSW 2234, Australia; tel: (02) 717-3493; fax: (02) 717-9265; email: tuniz@atom.ansto.gov.au.

ABOUT THE IAOS

The IAOS was established to:

(1) develop standards for analytic procedures and ensure inter-laboratory comparability;

(2) develop standards for recording and reporting obsidian hydration and characterization results;

(3) provide technical suport 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
· Life-Time Member $200.00

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

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

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

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

Viviana Ines Bellifemine, Secretary-Treasurer
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One Washington Square
San Jose State University
San Jose, California 95121-0113
(408) 629-7454

CALL FOR ARTICLES AND INFORMATION

Submissions for articles, short reports, abstracts, or announcements for inclusion in the next newsletter should be received by June 15, 1996. We accept electronic media on IBM compatible 3.5" or 5.25" diskettes in a variety of word processing formats, but Wordperfect (5.n) is preferred. A hard copy of the text and any figures should accompany diskettes. Send to Blossom Hamusek, 2874 Camulos Way, Redding, California, 96002, USA; tel: (916) 221-7852;

Short Reports and Reviews: If you are interested in briefly reporting on research findings (e.g., one column in length), contact Mike Rondeau at Caltrans Environmental Program, 1120 N St., P.O. Box 942874 MS 27, Sacramento, California, 94274-0001, USA; tel: (916) 653-0974; fax: (916) 653-6126; email: mrondeau@trmx3.dot.gov.ca

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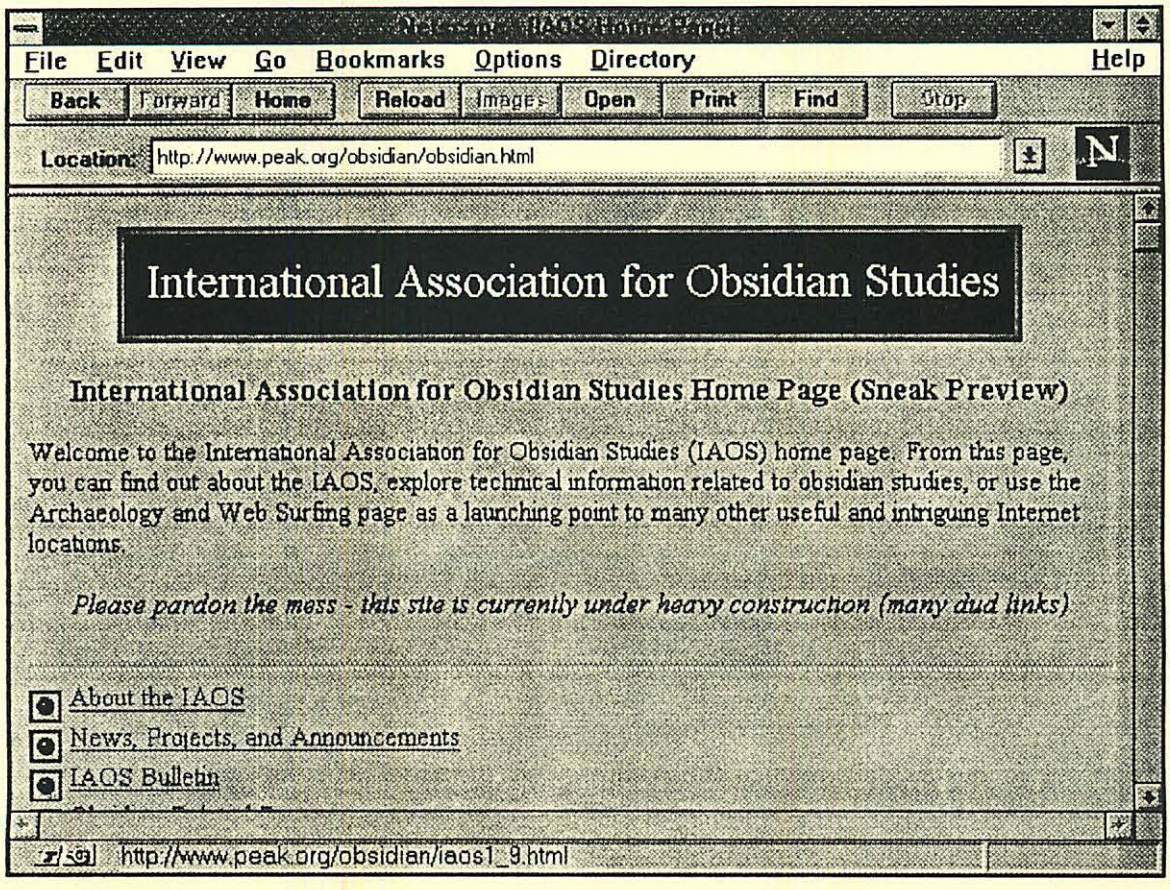

---------- Cut-Out ----------

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