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Journal of California and Great Basin Anthropology

Title

Meighan and Scalise, eds.: *Obsidian Dates IV: A Compendium of the Obsidian Hydration Determinations Made at the UCLA Obsidian Hydration Laboratory*

Permalink

<https://escholarship.org/uc/item/1nb5j8qf>

Journal

Journal of California and Great Basin Anthropology, 11(1)

ISSN

0191-3557

Author

Jackson, Thomas L.

Publication Date

1989-07-01

Peer reviewed

Shipman, Pat
1987 The Myths and Perturbing Realities of
Cannibalism. *Discover* 8(3):70-76.



***Obsidian Dates IV: A Compendium of the
Obsidian Hydration Determinations Made at the
UCLA Obsidian Hydration Laboratory.***

Clement W. Meighan and Janet L. Scalise,
eds. Los Angeles: University of California
Institute of Archaeology Monograph
XXIX, 1988, xi + 511 pp., \$12.75 (paper).

Reviewed by:

THOMAS L. JACKSON

BioSystems Analysis, Inc., 303 Potrero St., Suite 203,
Santa Cruz, CA 95060.

With this volume the Obsidian Hydration Laboratory at UCLA continues its distinguished and unique history of publishing the hydration determinations made by that laboratory. Part I of the volume contains two introductory papers by C. W. Meighan: "Progress in Obsidian Dating Studies," and "Information for Prospective Collaborators in Obsidian Dating." In the initial article, Meighan pens a brief history of obsidian dating studies and the operations of the UCLA laboratory, offering a perspective that understandably is personal and colloquial given his long and intimate association with the laboratory and research in hydration dating.

The development of the obsidian hydration dating method has not been without its difficulties, and fundamental research questions remain unresolved. Environmental factors (e.g., temperature, soil chemistry, and humidity) and the chemical and physical properties of the obsidian itself affect the rate at which hydration rinds develop on artifacts, but how each variable determines the hydration process is not clear. There also is a theoretical and methodical rift among hydration

dating specialists regarding the chronological interpretation of hydration rind measurements; between those that consider obsidian hydration as primarily a relative dating method, and those that interpret hydration readings for absolute chronometric determinations. These issues notwithstanding, and perhaps because of the interest in resolving them, the future of obsidian hydration dating has never been more promising.

Part II of the compendium offers 23 "Discussion Papers" and a comprehensive bibliography compiled for these contributions. It is not possible to comment on each paper in this brief review. Indeed, given the length of most of the titles, it is not practical even to list the contributions and their authors. The editors appropriately have termed these "discussion" papers; not all can be regarded as serious research papers. Some are brief technical reports, others document the archaeological context for hydration dates, and several argue for one hydration rate model or another to calculate absolute dates from hydration rind measurements. The emphasis on deriving calendric dates from hydration measurements is a conspicuous bias in many of these papers.

Remarks on several example papers will illustrate the diversity of topics covered. M. Q. Sutton's "Obsidian Analyses in the Mojave Desert, California: Results, Cautions, and Comments" is a coherent discussion of the methodical variables that must be considered in the collection and interpretation of obsidian hydration data. In "Obsidian Source Heterogeneity and Uniqueness: An Example in Western Mexico," G. Mahood emphasizes the importance of comprehensive sampling and chemical analysis of obsidian sources to determine variability in major- and trace-element abundances within each source area before relying on chemical indices to distinguish among different obsidian sources.

Establishing the chemical uniqueness of specific obsidian sources (and reliably assigning artifacts to sources) only can be accomplished by using as many diagnostic elements as possible and (ideally) with verification by an independent check such as K-Ar dating. Of the several papers in the volume concerning Mesoamerica, that by H. McKillop and L. J. Jackson, "Ancient Maya Obsidian Sources and Trade Routes," is a valuable compilation of obsidian sourcing results from most of the important sites in the lowland Maya areas of Belize, Guatemala, and Mexico. Curiously, there is no mention of obsidian hydration dating in that paper.

The "Hydration Reading Lists" that make up the third part of the monograph provide hydration measurements from samples collected around the world. The vast majority of samples are from sites in California, but some also are from sites in Nevada, Arizona, New Mexico, Colorado, and Wyoming. Latin America is represented by collections from Mexico, Guatemala, Belize, Honduras, Ecuador, Peru, and Chile. Hydration measurements are reported for artifacts from Easter Island, Indonesia, Georgian SSR, Greece, and Hungary. The hydration measurements were made at the laboratory between 1973 and 1987, and the names of at least 28 different technicians are listed on the reporting forms. It is unimaginable that the hydration measurements made over this long time span, and by so many different readers, are all comparable. The vast majority of hydration measurements are for specimens without any obsidian source assignment, a factor that seriously compromises their usefulness. These are, however, historical factors that are part of the development of any laboratory. Remedial measures to standardize the hydration measurements will have to be implemented by all researchers and laboratories sooner or later.

Part IV, "Obsidian Hydration and Related Studies: A Reference Bibliography," has three sections: "Studies Related to Obsidian Hydration"; "Obsidian Source Analysis and Implications"; and "Obsidian Exchange Studies and Related Topics." The bibliographies, compiled by J. Scalise, are not comprehensive but will be helpful for the undergraduate student or other novice seeking an introduction to the literature of obsidian studies. Oddly, some relevant entries in the bibliography of the discussion papers are not incorporated into these reference bibliographies.

Many of the concerns noted by Meighan regarding state-of-the-art hydration dating are being addressed by members of the newly organized International Association for Obsidian Studies.¹ The goals of the Association are listed in the first number of its Newsletter:

- (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.

The organization and management of obsidian hydration data is a critical problem. The UCLA laboratory has made more than 13,000 measurements. The obsidian hydration laboratory at Sonoma State University has logged more than 15,000 measurements. These are the two oldest and largest laboratories in California and these examples indicate the magnitude of the unsystematized hydration data in North America.

Meighan opines in his introduction to the compendium (p. 3) that "obsidian hydration dating is no longer in its infancy." Ten years ago Michels and Tsong (1980) declared a "coming of age" for hydration dating. Although the method may be out of diapers,

and there are symptoms of an intellectual puberty, it will be a while yet before we get the keys to the microscope and do any serious dating.

NOTE

1. Address: International Association for Obsidian Studies, Dept. of Anthropology, California State Univ., Chico, CA 95929.

REFERENCE

Michels, Joseph W., and Ignatius S. T. Tsong
1980 Obsidian Dating: A Coming of Age. In:
Advances in Archaeological Method and
Theory, M. B. Schiffer, ed., pp. 405-444.
New York: Academic Press.



An Introduction to the Archaeology of the Western Mojave Desert, California. Mark Q.

Sutton. Salinas: Coyote Press *Archives of California Prehistory* No. 14, 1988, vi + 104 pp., 29 figs., 9 tables, appendix, bibliography, \$8.70 (paper).

Reviewed by:

BRUCE LOVE

Pyramid Archaeology, 37462 3rd St. East, Palmdale, CA 93550.

The basic sources on California archaeology and ethnography are in agreement about the western Mojave Desert. They concur that there are practically no published excavation or survey reports, that there is no confirmed cultural sequence, and that a paucity of ethnographic literature makes cultural identification almost impossible. Fortunately, these problems are becoming less acute.

With the population and building explosion in the Antelope Valley and eastern Kern County, surveys and test excavations mandated by the California Environmental Quality Act are happening at a dizzying pace. Archaeologists from throughout southern California are working, in increasing numbers,

in the western Mojave Desert. The results of their surveys and testing programs are becoming available.

With this background, it can be said that Sutton's *An Introduction to the Archaeology of the Western Mojave Desert, California* has appeared just in time. For archaeologists working in this part of southern California, there is a need to know the pertinent research questions. What kinds of dates can be expected? What kinds of lithics, pottery, and rock art are there? For any question about western Mojave Desert archaeology, the essential source book now is Sutton's *Introduction*. In essence, Sutton has summarized and synthesized nothing less than all the archaeology ever done in the Antelope and Fremont valleys up to 1988. Most of the data were unpublished and unavailable to archaeologists other than those who did the original work. With so many new archaeologists working in the area, Sutton's *Introduction* has arrived at a crucial time.

The strength of Sutton's work is the presentation of raw data, organized by category, that facilitates comparisons with data from outside the area and new findings from within the area. The introduction clearly sets out Sutton's goals, to summarize and synthesize the rather substantial unpublished literature on the area. Chapter 2 succinctly describes the environmental setting and includes a brief section on all the important lithic resources. Chapter 3 reviews the meager ethnographic background data for the area, underscoring the deficiencies in our information on the cultural make-up of the region. Chapter 4 reviews the history of archaeological research of the area which began with private collections in the 1930s, proceeded to excavations by avocationalists in the 1950s, and finally to professional archaeology from the 1960s to the present.

Chapters 5, 6, and 7 synthesize the data,