CONTRIBUTIONS
OF THE
UNIVERSITY OF CALIFORNIA
ARCHAEOLOGICAL RESEARCH FACILITY

Number 16 October, 1972

STUDIES IN THE ARCHAEOLOGY OF MEXICO AND GUATEMALA

Edited by John A. Graham

UNIVERSITY OF CALIFORNIA
DEPARTMENT OF ANTHROPOLOGY
BERKELEY, CALIFORNIA

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PREFACE

With the present volume, a total of 16 numbers of the Contributions of the University of California Archaeological Research Facility have appeared during the eight years since the series was inaugurated in 1965. The first volume was Sources of Stone Used in Prehistoric Mesoamerican Sites, but subsequent volumes have alternated somewhat irregularly between Mexican and Central American archaeology on the one hand, California and Great Basin archaeology on the other, an aim set forth in the editorial announcement of the series's founding. Originally, Contributions were distributed upon a gratis basis. But severe budgetary reductions imposed upon the Facility required that a modest charge be made for subsequent numbers, and it has been the proceeds from these sales that have been a major factor enabling the Facility to maintain publication in these difficult times. Most past numbers of the Contributions have become out-of-print shortly after appearance, perhaps an indication of their success.

The first volume of the Contributions contained two papers exploring the feasibility and potentials of x-ray fluorescence analysis in the identification of obsidian types and their sources, one line of investigation that has continued to be pursued and refined through subsequent numbers of the series into the present volume. Two symposia have seen the light of publication in the Contributions: "The Emergence of Civilization in Mesoamerica," organized by R. F. Heizer and J. A. Graham and held at Burg Wartenstein, Austria, in July of 1970 under sponsorship of the Wenner-Gren Foundation for Anthropological Research (Contribution 11), and "The Application of the Physical Sciences to Archaeology" (Contribution 12), a symposium held on June 23, 1970 under the auspices of the Pacific Division of the American Association for the Advancement of Science, the California Section of the American Chemical Society, and the San Francisco Society of the Archaeological Institute of America. Although most of the papers appearing in the Contributions series have been authored by associates and students working in the Archaeological Research Facility, it has been possible at times to include important papers prepared by colleagues at other institutions, as in the case of the present volume.

With the exception of the two papers on trace-element analyses of obsidian samples from Cholula and Veracruz, the present volume of studies is devoted entirely to Maya archaeology. The collection represents a geographical range extending from the Huaxtec Maya zone in San Luis Potosi to the Guatemalan highlands and Honduras and embraces a temporal range from earliest levels to the ethnohistoric period as well as including a review of methods of recording Maya sculpture in the modern epoch of study and research.

John A. Graham
Berkeley

VIII. TRACE ELEMENT ANALYSIS OF OBSIDIAN FROM THE SITE OF CHOLULA, MEXICO*

Thomas R. Hester, Robert N. Jack and Robert F. Heizer

The archaeological site of Cholula is located in the state of Puebla, central Mexico, about 65 miles southeast of Mexico City (Figure 1). During a brief visit to the site in 1970, we were able to obtain a sample of 89 obsidian artifacts. These specimens have been subjected to rapid-scan x-ray fluorescence analysis, a technique which we have previously used to determine the geologic sources of archaeological obsidian. Procedures followed in the analysis are the same as those outlined in Hester, Jack and Heizer (1971:93).

Our sample was collected from the surface of excavation backdirt on the west side of the Cholula pyramid and are undated. Presumably, the materials belong to the Classic period. We are fully concious of the desirability of analyzing obsidian samples recovered from dated archaeological contexts since only information secured from this kind of material can provide us with hints of changing obsidian trade or procurement patterns over time at specific sites. However, we consider data such as presented here of value in giving us some indication of the geologic sources which furnished obsidian to prehistoric sites. We caution that inferences on "trade networks" and the like cannot safely be drawn from information such as given here for the site of Cholula.

As shown in Table 1 and Figure 2, x-ray fluorescence analysis has revealed the presence of six distinct obsidian groups or types in the Cholula sample. These have been earlier designated as types A-G (Hester, Jack and Heizer 1971: Table 8). At the present, we are able to correlate the following types with a specific obsidian source: type A (Cerro de las Navajas, Hidalgo); type D (Zaragoza, Puebla); type E (Cerro de Minas, Puebla); and, type G (Guadalupe Victoria, Puebla). The geologic sources of types B and F (both represented at Cholula) are not known. Type C obsidian, another of the types whose source is unknown, does not appear in our sample.

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* We wish to thank Dean Sanford Elberg, Graduate Division, for funds to partially defray costs of the 1970 trip to Mexico (course Anthropology 296A), as well as the Archaeological Research Facility for support funds. The Ford Foundation Graduate Traineeships in Archaeology grant provided part of the travel and support funds.

Type D (Zaragoza) is the major type at Cholula, comprising almost 54% of the sample. This is of interest, since this type is the one used almost wholly by the peoples of Tres Zapotes, Veracruz (Hester, Jack and Heizer 1971). Similarly, type B (geologic source unknown) which is also prominent in the Cholula collection occurs as a major type at the site of La Venta, Tabasco (see Hester, Heizer, and Jack 1971) and is present at the site of San Lorenzo (Cobean et al. 1971).

All of the obsidian sources represented in our Cholula sample are fairly close at hand, lying within a 75-mile radius of the site (Figure 1). The most distant sources are Cerro de las Navajas and Zaragoza, both about 75 miles away. Guadalupe Victoria and Cerro de Minas are 65-70 miles east of the site. Although there is considerable evidence of Teotihuacan influence at the site of Cholula, it is somewhat puzzling that we found no obsidian from the Otumba (Teotihuacan) source. This geologic source is closer to Cholula than any of the others represented in our sample. Given the poor contextual data associated with our sample, it would not be wise to speculate on the reasons for the absence of Otumba obsidian at Cholula. However, Michels (1971:266) notes that during the Colonial period, sites within the Teotihuacan Valley "...show noticeably greater use of gray [Otumba] obsidian...". Perhaps during the Classic period, these same sites more or less controlled the distribution of Otumba obsidian, and most of it was allocated for local consumption. This seems likely, for little obsidian of this type is represented at sites outside the Valley of Mexico. On the other hand, Cerro de las Navajas obsidian (the other major Valley of Mexico source) is quite widely distributed (Stross et al., in press).

With a small sample such as ours, we cannot deal with the important question of whether obsidian from the various sources was being brought to Cholula as raw material or if perhaps some of it was being traded to the site in the form of blades or finished artifacts. Of the artifacts in our sample, 76% are blades or blade fragments. Eight of the blades have trimming or use retouch on the lateral edges; of these, seven are of type D (Zaragoza) obsidian. This is the only artifact group which is largely restricted to a specific obsidian type. The remainder of the Cholula sample is composed of flakes and flake fragments (20%) and unifacial and bifacial tools (4%).

Table 1.

Obsidian Types at Cholula, Puebla

Type and location	No. of samples	Percent
A (Cerro de las Navajas)	16	18.0%
B (unknown)	13	14.6
C (unknown)	0	0.0
D (Zaragoza)	48	53.9
E (Cerro de Minas)	3	3.4
F (unknown)	2	2.2
G (Guadalupe Victoria)	7	7.9
	(89)	(100.0)

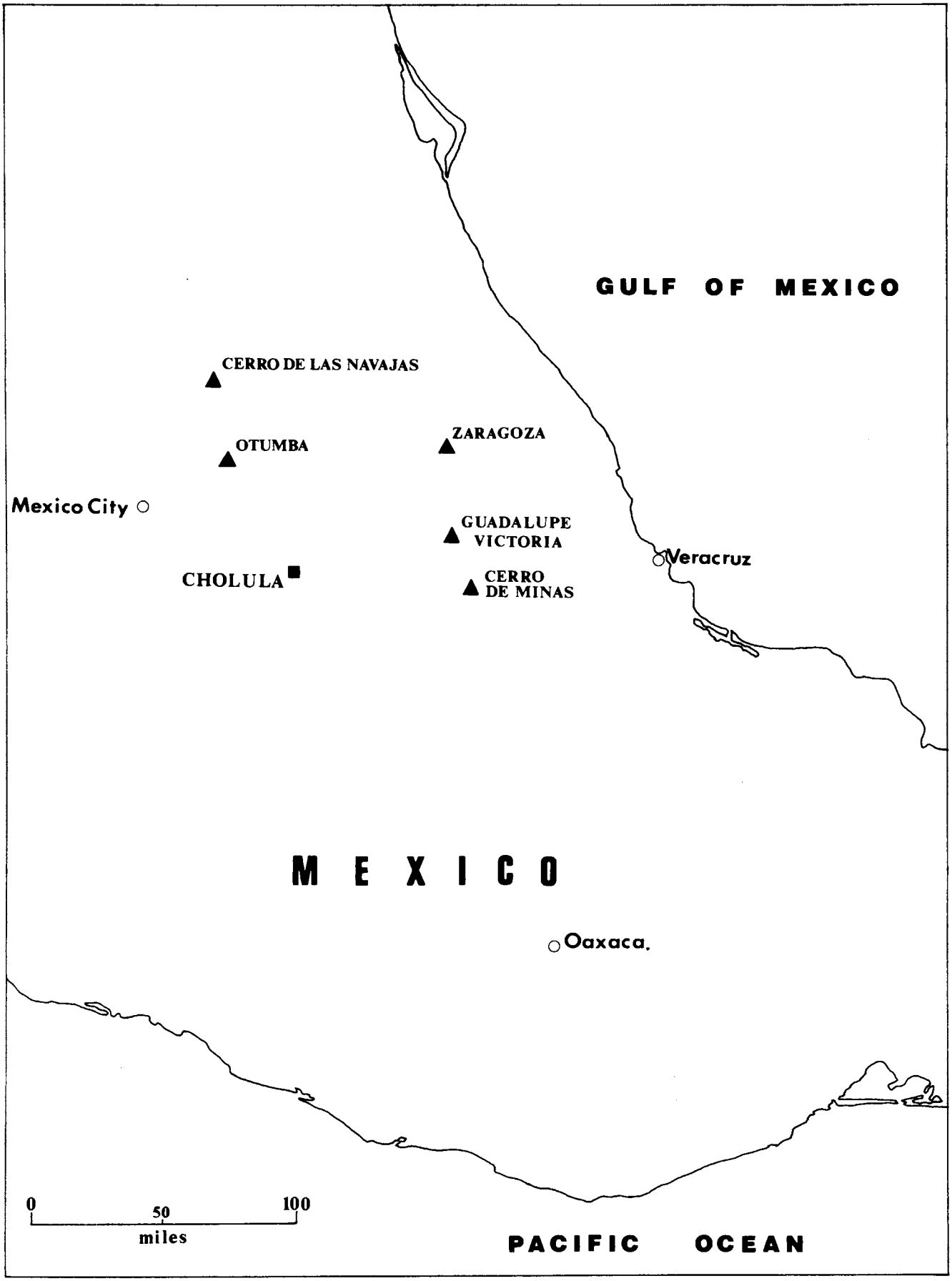

Figure 1. Location of the site of Cholula and geologic obsidian sources in central and southeastern Mexico.

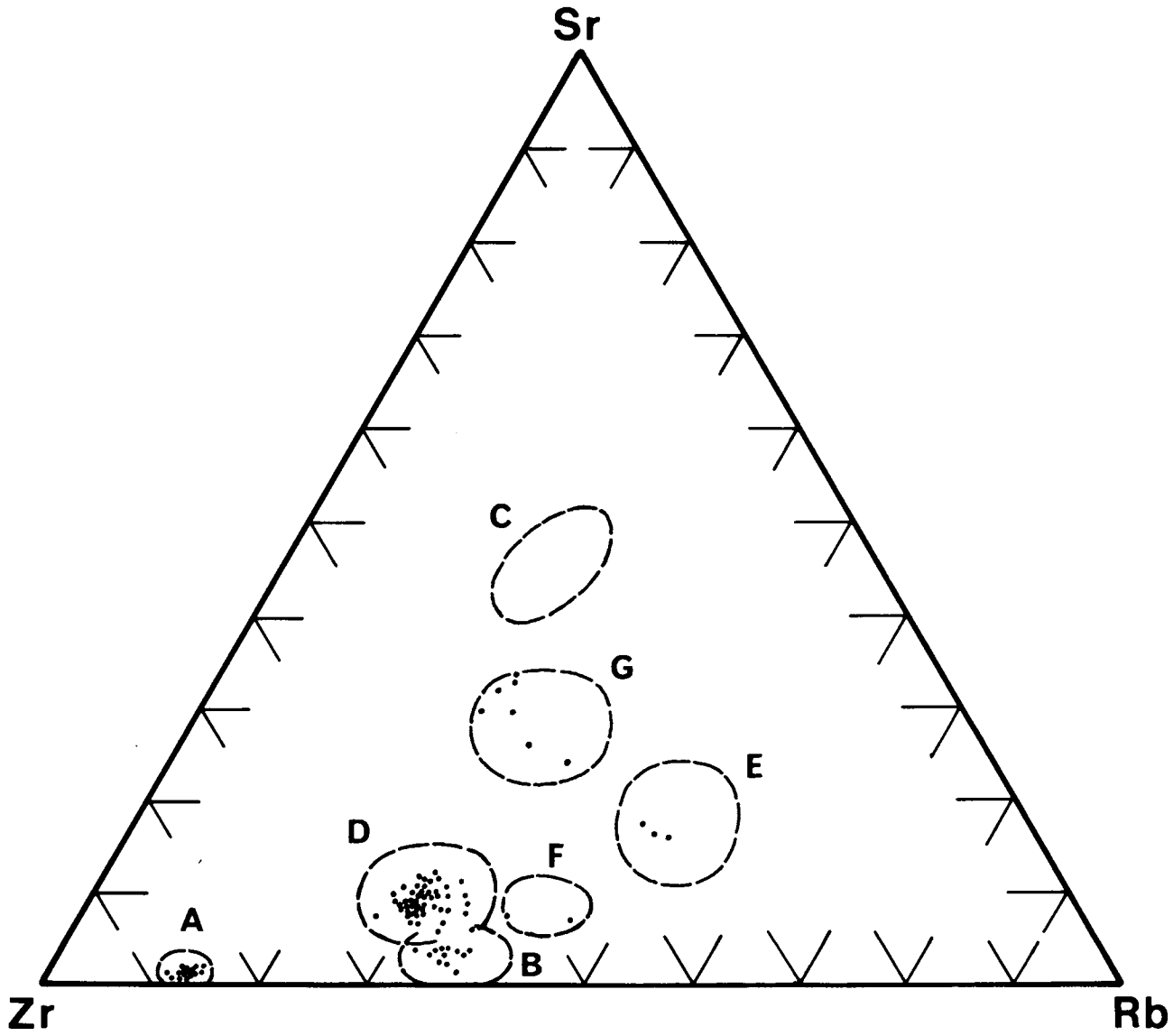

Figure 2. Plotted results of rapid-scan analysis of obsidian artifacts from Cholula, Puebla, Mexico. Each point represents the relative Rubidium (Rb) K-alpha, Strontium (Sr) K-alpha, and Zirconium (Zr) K-alpha intensities for one artifact.

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