

**CONTRIBUTIONS  
OF THE  
UNIVERSITY OF CALIFORNIA  
ARCHAEOLOGICAL RESEARCH FACILITY**

**Number 16**

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**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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Department of Anthropology

Berkeley

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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 Huastec 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.

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IX. SOURCES FOR THE OBSIDIAN AT THE RUINS OF  
SEIBAL, PETEN, GUATEMALA

John A. Graham, Thomas R. Hester and Robert N. Jack

Professor Gordon R. Willey of Harvard University has provided us with a sample of 14 obsidian artifacts (blades and blade fragments) from the ruins of Seibal, Guatemala. Seibal is an important lowland Maya site located on the Pasion River of southwestern Peten (Figure 1). Under Professor Willey's direction, the Peabody Museum of Harvard carried out excavations at the ruin from 1964 through 1968. These explorations have resulted in the discovery of the earliest as yet identified ceramic complex in the Southern Maya Lowlands, dating to about 800 B.C., and have yielded an important cultural sequence that leads through the PreClassic to a terminal Classic age characterized by an intrusive and exotic cultural tradition (1). Since the sample of obsidian artifacts can be linked to specific contexts within this cultural sequence, the specimens are especially useful for trace element analysis and source determination. The analyses reported here were undertaken by rapid-scan x-ray fluorescence techniques (Figure 2).

As might be anticipated, most of the obsidian in the sample is derived from geologic deposits in the volcanic highlands of Guatemala. Five specimens are identified as deriving from the deposits at El Chayal, and one specimen derives from Ixtepeque (Figure 1). Type C obsidian is represented by six artifacts. The problems involving the identification of the type C obsidian source have been discussed previously (Hester, Jack, and Heizer 1971), and on the basis of more recent comparisons we can say that it is highly probable that this type represents the source near San Martin Jilotepeque (Figure 1). This San Martin Jilotepeque source appears to be the same as Aldea Chatalun (Cobean et al. 1971). Since type C obsidian is found at sites outside the Maya area (for example, at La Venta, Tabasco), the matter of an accurate source identification is of considerable interest.

There is a single specimen of type D obsidian at Seibal. This type has been linked to a Mexican source near Zaragoza, Puebla (Hester, Jack, and

Heizer 1971), over 500 miles northwest of Seibal. Finally, there is one specimen in the sample which cannot now be identified as to source derivation (2).

Table 1 lists the obsidian specimens analyzed and indicates their geologic source identification as well as their phase context within the Seibal archaeological sequence. As noted, all but three of the 14 samples derive either from the obsidian deposits at El Chayal or source C (San Martin Jilotepeque). Although the sample is small, these two major sources appear to have been of importance in supplying obsidian to Seibal at different periods in the site's history. Of the early Real (800-600 B.C.) and Escoba (600-300 B.C.) phases, three samples are derived from source C and one sample from El Chayal. During the subsequent Cantutse phase (300 B.C.-A.D. 270), a single sample is present and derives from source C. Another sample, attributable to either Cantutse or the subsequent Junco (A.D. 270-500) phase, is also from source C. With the Tepejilote phase (A.D. 690-770), the El Chayal source begins to come into importance; two samples were analyzed for the phase, one being El Chayal derived and the other being of an unidentified source. Finally, during the Bayal phase (A.D. 770-930) five samples analyzed indicated that four were of El Chayal derivation while one is of source D origin (Zaragoza, Puebla). A sixth Bayal sample, but possibly of the preceding Tepejilote phase, is identified as derived from Ixtepeque.

To summarize briefly, source C appears to be the important source of Seibal obsidian during the Preclassic period while El Chayal figures as the important source during the Late Classic. As the Late Classic Bayal phase is a period in which many non-Classic features appear at Seibal, it is exciting to find the single Mexican sample (source D) occurring within this context. It will be interesting to see if analysis of a larger number of samples will substantiate this apparent pattern.

#### Notes

1. An outline of the Seibal sequence may be found in Willey (1970: 317-320).
2. Additional analyses of Seibal obsidian and of source samples from Guatemalan highland obsidian deposits can be found in Stross et al. (in press).

Table 1.

## Obsidian Sources at Seibal

Spec. No.	Sample Identification and Phase	Obsidian Type or Source
1	S-2951; 107(B) 9 (Escoba or Real)	C (probably San Martin Jilotepeque)
2	S-2951; 107(B) 9; second specimen. (Escoba or Real)	C
3	S-2952; 107(B) 10 (Escoba or Real)	El Chayal
4	S-2989; 104(H) 2d (Bayal)	El Chayal
5	S-3019; 136(R) 1 (Bayal)	El Chayal
6	S-3042; 135(E) 11 (Bayal)	El Chayal
7	S-3131; 137(C) 3 (Bayal, possibly of Tepejilote origin)	Ixtepeque
8	S-3142; 138(B) 8 (Cantutse)	C
9	S-3149(A); 135(P) 1 (Bayal)	C
10	S-3149(B); 135(P) 1 (Bayal)	D (Zaragoza, Puebla)
11	S-3164; 140(B) 7 (Tepejilote)	unknown type
12	S-3165; 140(B) 8 (Tepejilote)	El Chayal
13	S-3266; 144(B) 10 (Junco or Cantutse)	C
14	S-3371; 162(B) 13 (Escoba)	C



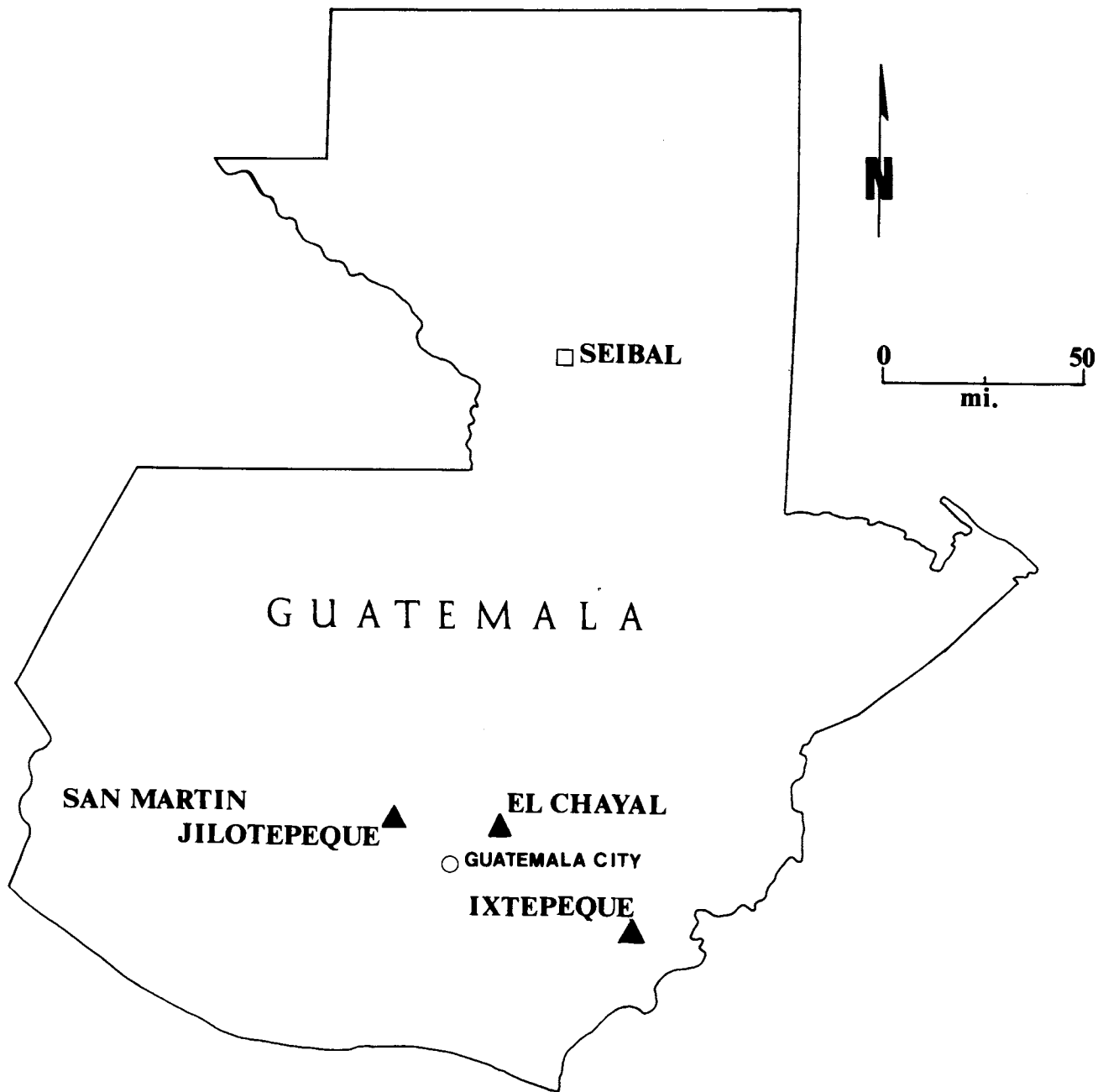


Figure 1. Location of the site of Seibal and of major geologic obsidian sources in Guatemala.

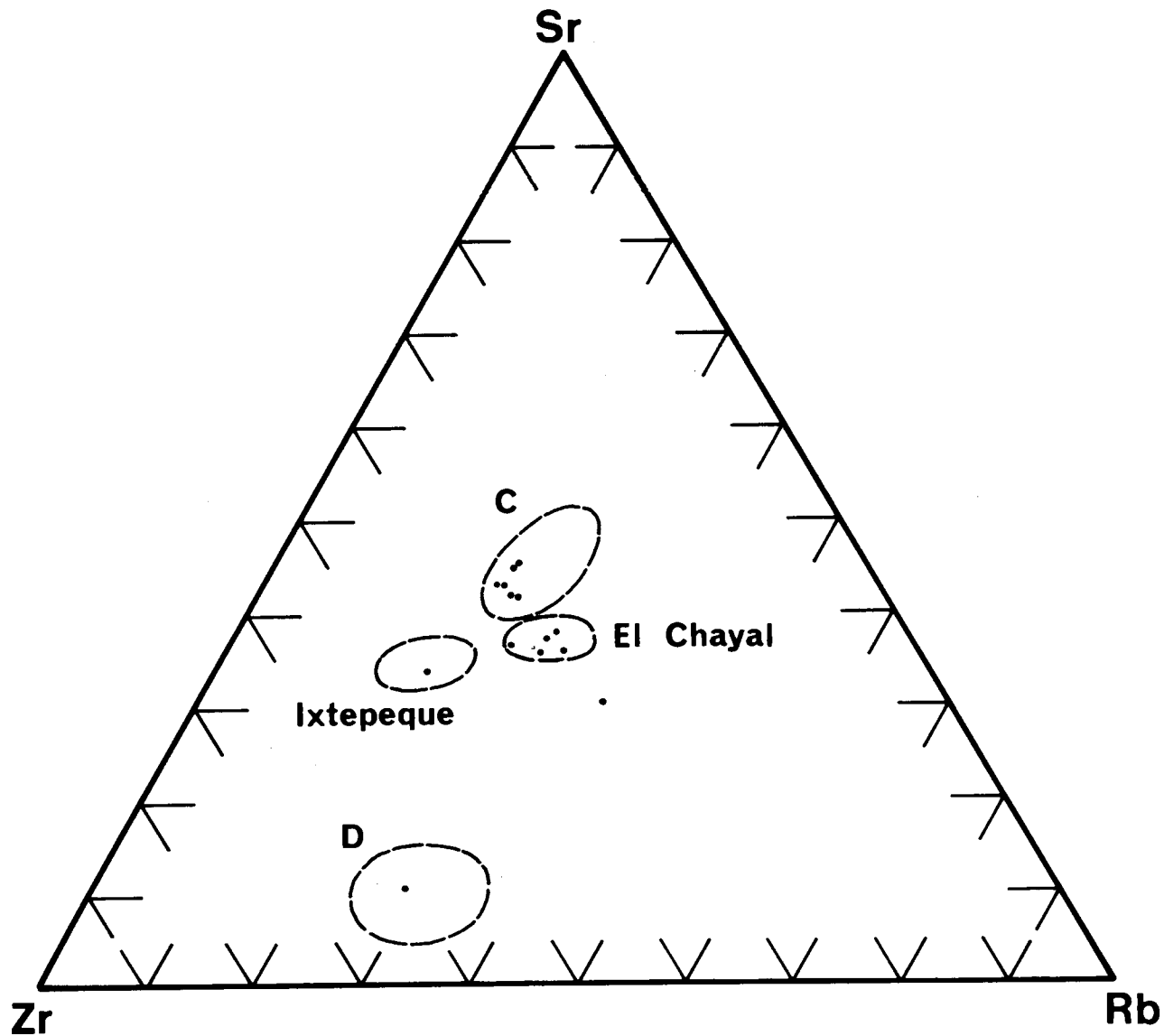


Figure 2. Plotted results of rapid-scan analysis of obsidian artifacts from Seibal, Peten, Guatemala. Each point represents the relative Rubidium (Rb) K-alpha, Strontium (Sr) K-alpha, and Zirconium (Zr) K-alpha intensities for one artifact.

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